IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Allen Ray Harrison

Conf. No.: 2684

Application No.: 10/099,825

Art Unit: 3625

Filed: March 15, 2002

Examiner: R. M. Pond

For: METHOD, APPARATUS AND SYSTEM FOR
PROVIDING ADVISORY INFORMATION
FOR A WEB-BASED SALES APPLICATION

DECLARATION PURSUANT TO 37 CFR § 1.131

In connection with the Applicants' Response to the Office Action dated April 4, 2008,

this Declaration sets forth the pertinent facts proving actual reduction to practice of the claimed

invention no later than ***February 22, 2000***.

1. We, Allen Ray Harrison, Bruce Alan Oney, Murli Challappa, and James H. White

   (hereinafter "the Inventors"), are the inventors of the subject matter described and

   claimed in U.S. Patent Application Serial No. 10/099,825 entitled "Method,

   Apparatus and System for Providing Advisory Information for a Web-Based Sales

   Application" (hereinafter, the "'825 Application").

2. We, the Inventors, conceived and implemented our invention as described and

   claimed in the '825 Application in the US and the UK (a WTO member country).

3. We, the Inventors, conceived and implemented our invention as described and

   claimed in the '825 Application no later than February 22, 2000, as evidenced by:

(*i*)   a screen shot of a file directory for a file system storing various

presentations including a Jim_toolbox_demo presentation, a

JobPlanner2000_final presentation, a FE_AnswerProducts99fin

presentation, a ServiceAdvisor presentation, and the last modified dates

of the presentations (*see* Tab A).

(ii)   the Jim_toolbox_demo presentation having the last modified date of

February 10, 1999, and showing multiple screen shots from the

invention described and claimed in the '825 Application (*see* Tab B);

(iii)   the Job_Planner2000_final presentation having the last modified date of

March 29, 1999, and showing sample user requirements, oilfield

products and services to satisfy the user requirements, multiple

recommendation values for the oilfield products and services, and one or

more ranked lists comprising the oilfield products and services, as

described and claimed in the '825 Application (*see* Tab C);

(iv)   the FE_AnswerProducts99fin presentation having the last modified date

of September 10, 1999, and showing, at least, the multiple features and

operation of the correlation engine and advisor function module, as

described and claimed in the '825 Application (*see* Tab D); and

(v)   the ServiceAdvisor presentation having the last modified date of

February 22, 2000, showing oilfield products and services to satisfy

user requirements, multiple recommendation values for the oilfield

products and services, and one or more ranked lists comprising the

oilfield products and services, as described and claimed in the '825

Application (*see* Tab E).

We, the Inventors, hereby declare that all statements made herein of my own knowledge are true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signed this ___ day of October 2008.

Allen Ray Harrison

Signed this ___ day of October 2008.

_____
Bruce Alan Oney

Signed this ___ day of October 2008.

_____
Murli Challappa

Signed this ___ day of October 2008.

_____
James H. White

420368_1

3

user requirements, multiple recommendation values for the oilfield

products and services, and one or more ranked lists comprising the

oilfield products and services, as described and claimed in the '825

Application (*see* Tab E).

We, the Inventors, hereby declare that all statements made herein of my own knowledge are true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signed this ___ day of October 2008.

_____
Allen Ray Harrison

Signed this 3RD day of October 2008.

_____
Bruce Alan Oney

Signed this ___ day of October 2008.

_____
Murli Challappa

Signed this ___ day of October 2008.

_____
James H. White

420368_1

user requirements, multiple recommendation values for the oilfield

products and services, and one or more ranked lists comprising the

oilfield products and services, as described and claimed in the '825

Application (*see* Tab E).

We, the Inventors, hereby declare that all statements made herein of my own knowledge

are true; and further that these statements were made with the knowledge that willful false

statements and the like so made are punishable by fine or imprisonment, or both, under Section

1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the

validity of the application or any patent issued thereon.

Signed this ___ day of October 2008.   _____
                                                         Allen Ray Harrison

Signed this ___ day of October 2008.   _____
                                                         Bruce Alan Oney

Signed this 2nd day of October 2008.   _____
                                                         Murli Challappa

Signed this ___ day of October 2008.   _____
                                                         James H. White

420368 1

3

user requirements, multiple recommendation values for the oilfield

products and services, and one or more ranked lists comprising the

oilfield products and services, as described and claimed in the '825

Application (*see* Tab E).

We, the Inventors, hereby declare that all statements made herein of my own knowledge

are true; and further that these statements were made with the knowledge that willful false

statements and the like so made are punishable by fine or imprisonment, or both, under Section

1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the

validity of the application or any patent issued thereon.

Signed this ___ day of October 2008.   _____
                                            Allen Ray Harrison

Signed this ___ day of October 2008.   _____
                                            Bruce Alan Oney

Signed this ___ day of October 2008.   _____
                                            Murli Challappa

Signed this _3_ day of October 2008.   _____
                                            James H. White

420368_1

3

TAB A

FE_21_Projects

File Edit View Favorites Tools Help

Back ▾ ⊙ ▾ ⇗ ⟲ Search Folders

Address C:\Documents and Settings\mjm\Desktop\SLB 108001\ARCHIVE_jw\FE_21_Projects

Name	Size	Type	Date Modified
ToolAdvisor		File Folder	9/25/2008 6:00 AM
vb_work		File Folder	9/25/2008 6:01 AM
Jim_toolbox_demo	379 KB	Microsoft PowerPoi...	2/10/1999 1:59 AM
JobPlanner2000_final	567 KB	Microsoft PowerPoi...	3/29/1999 1:53 PM
FE_AnswerProducts99fin	1,621 KB	Microsoft PowerPoi...	9/10/1999 1:30 PM
ServiceAdvisor	875 KB	Microsoft PowerPoi...	2/22/2000 11:51 AM
Revolutionizing_Formation_Ev...	1,080 KB	Adobe Acrobat 7.0 ...	10/24/2003 10:10 AM

File and Folder Tasks ⨠

Other Places ⨠

Details ⨠

TAB B

Client Toolbox

Attached are a series of screencaptures
from a short interactive demo. They show
how a Client deliverable using the Toolbox
might look in two to three years time.

This is NOT a definitive description
of how the Toolbox will look!

Front screen (welcome page)


Welcome to Client Toolbox

The following data is available for review

Client	BP
Field	Magnus
Well	M38
Date logged	10 Aug 98

Click here for more information in using Client Desktop

Finish

Welcome Page | Composite Displays | Wellsite Prints + Data | Other Data | General Utilites
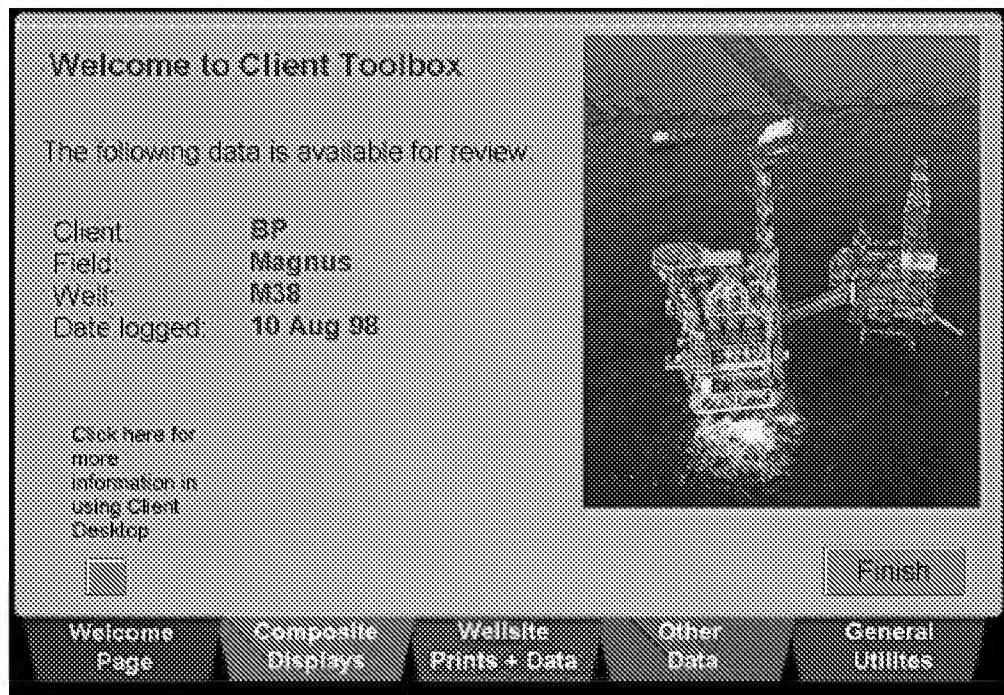
Press general utilities tab to get......

General Utilities

Please select required utility

Graphics:
PDSView 3.0
WITS viewer
PDS to GIF, PDS to CGM, PDS to WMF
WMF to PDS

Data:
DLIS to ASCII, DLIS to LAS
DLIS to LIS
DLIS Viewer, DLIS verification

Interact: Client version

Tool Planners

Finish

Welcome Page | Composite Displays | Wellsite Prints + Data | Other Data | General Utilites
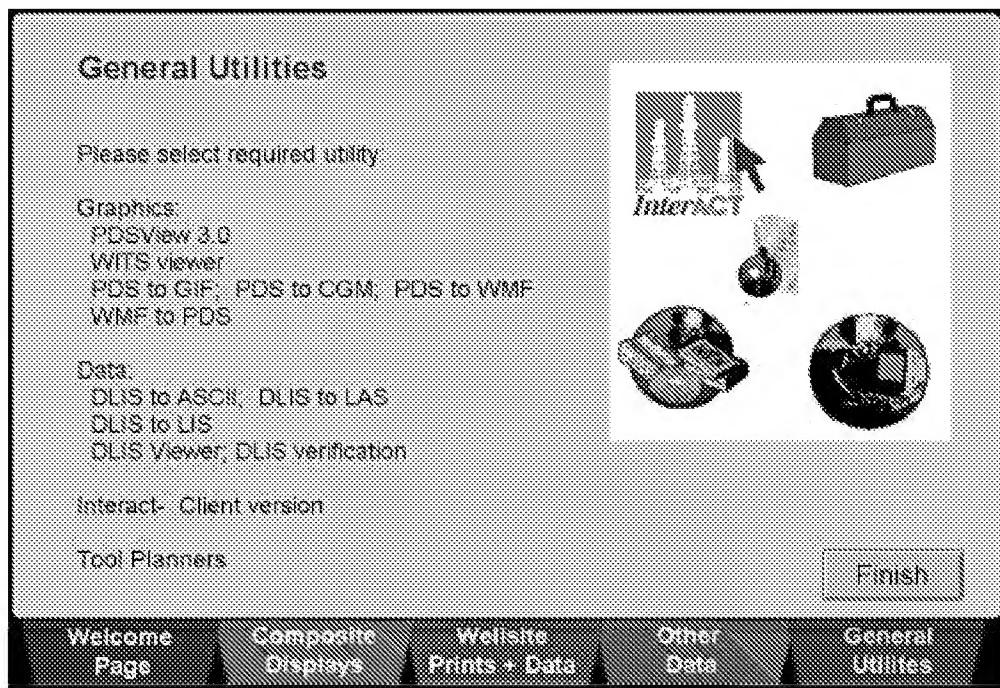
Press 'Wellsite Prints + Data' tab to get......

Wellsite Prints + Data

Prints

Resistivity
Density/Neutron
Sonic
Magnetic Resonance
Images
Pressures and Sampling
Others

Data

Finish

| Welcome Page | Composite Displays | Wellsite Prints + Data | Other Data | General Utilites |

...then select 'Sonic' to get......

Wellsite prints - sonic

DSI_MAIN_REP_500.pds   DSI_MAIN_REP_200.pds

DSI_U_DIPOLE_VDL.pds

Return

Double click icon to start PDSVIEW
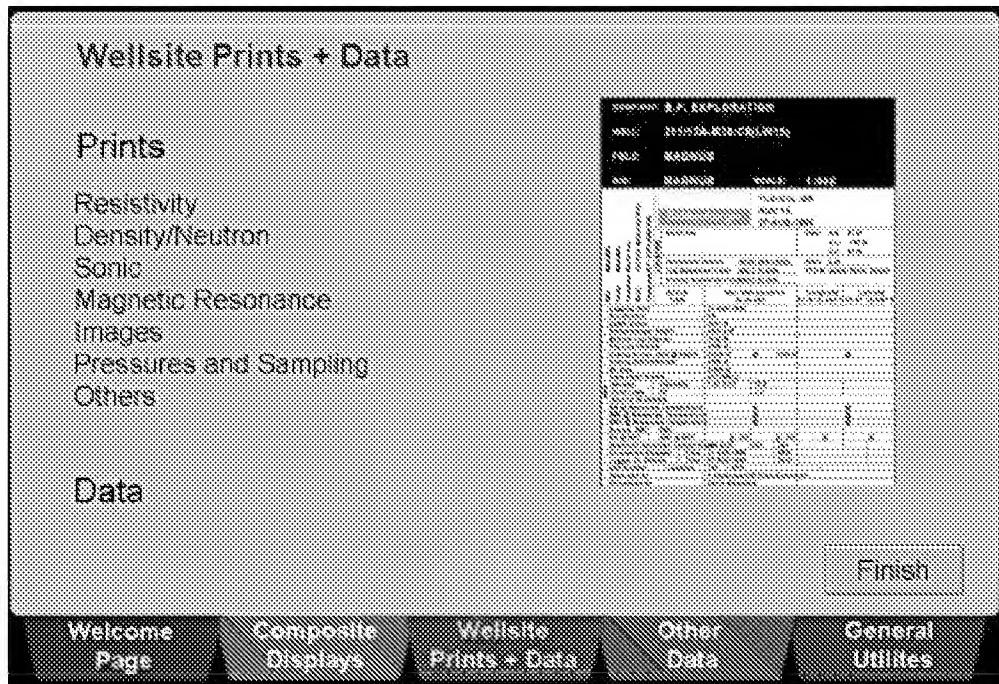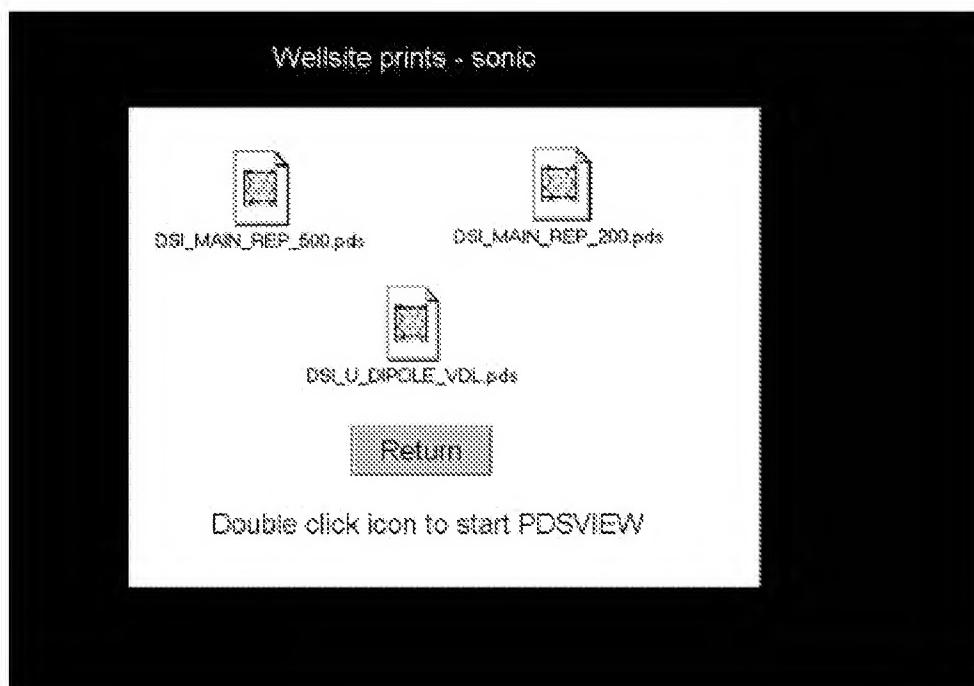
or select 'Resistivity' to get......
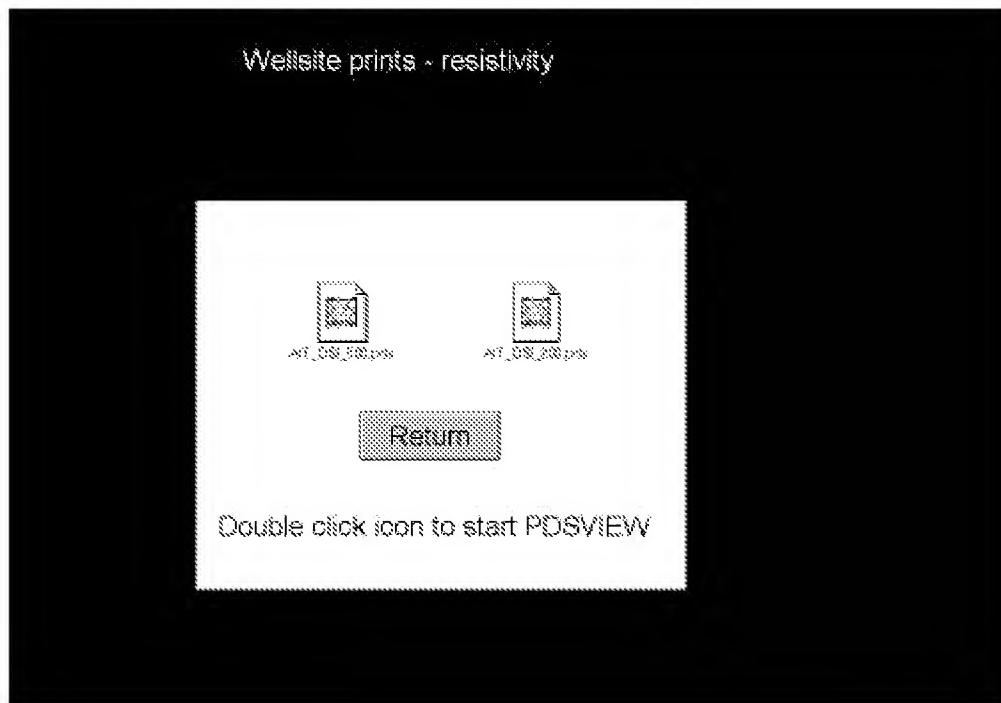
... and double click AIT_DSI_500.pds to fire up PDSView
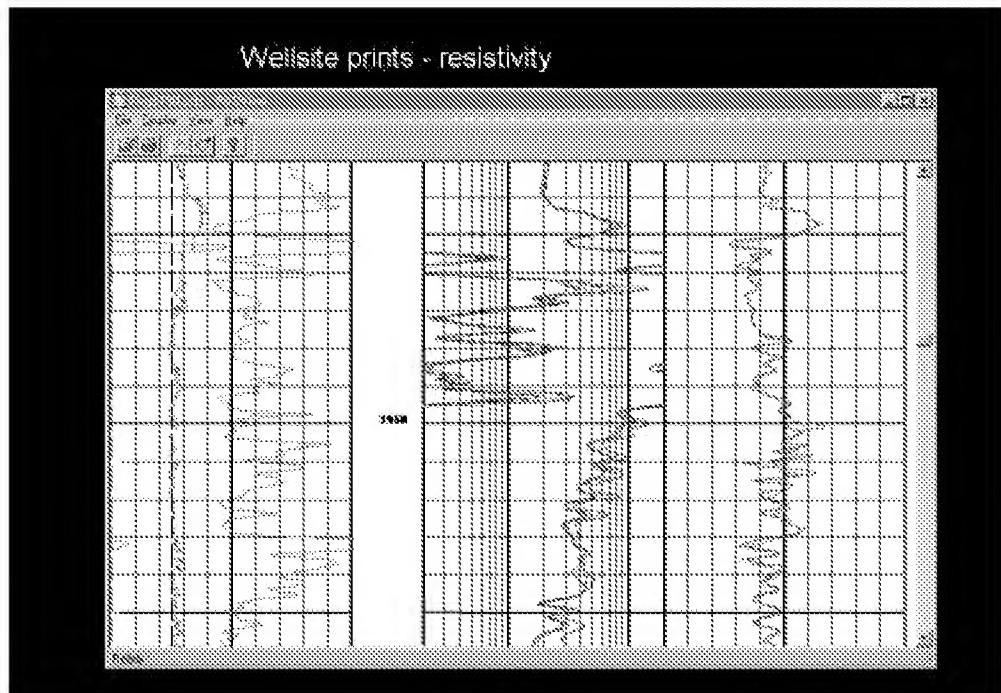
Back to main menu 'composite display' tab......

Composite Displays

Please select the composite for review

General
Lithology
Pressure
Producibility
Hydrocarbon Pore Volume
Dips / Faults / Fractures
Geomechanics
Seismic

Finish

| Welcome Page | Composite Displays | Wellsite Prints + Data | Other Data | General Utilites |
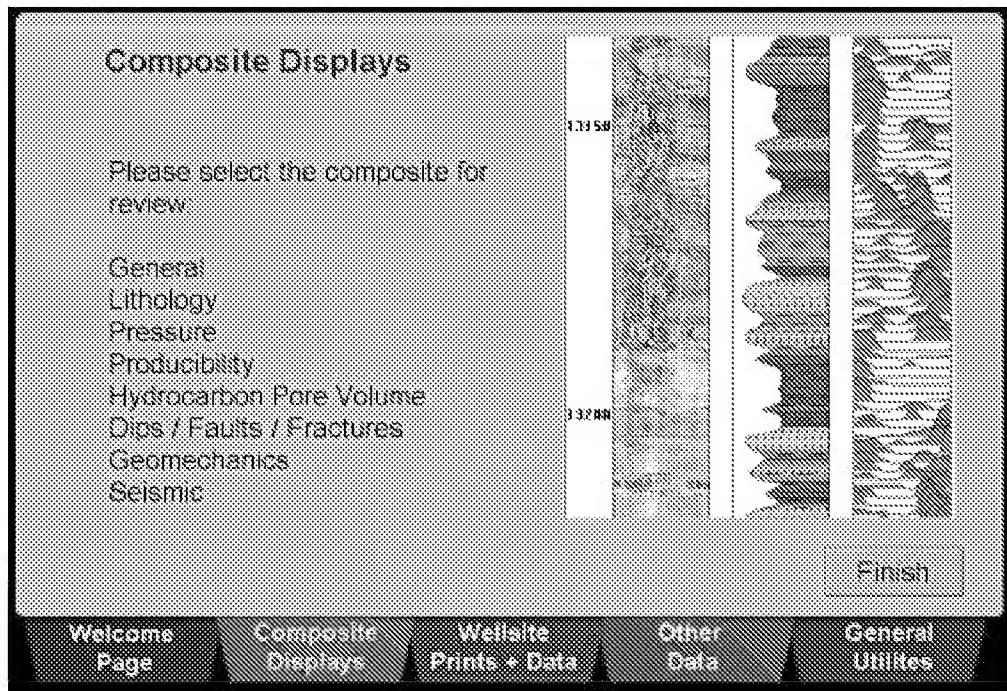
....press 'lithology' to get......

Return
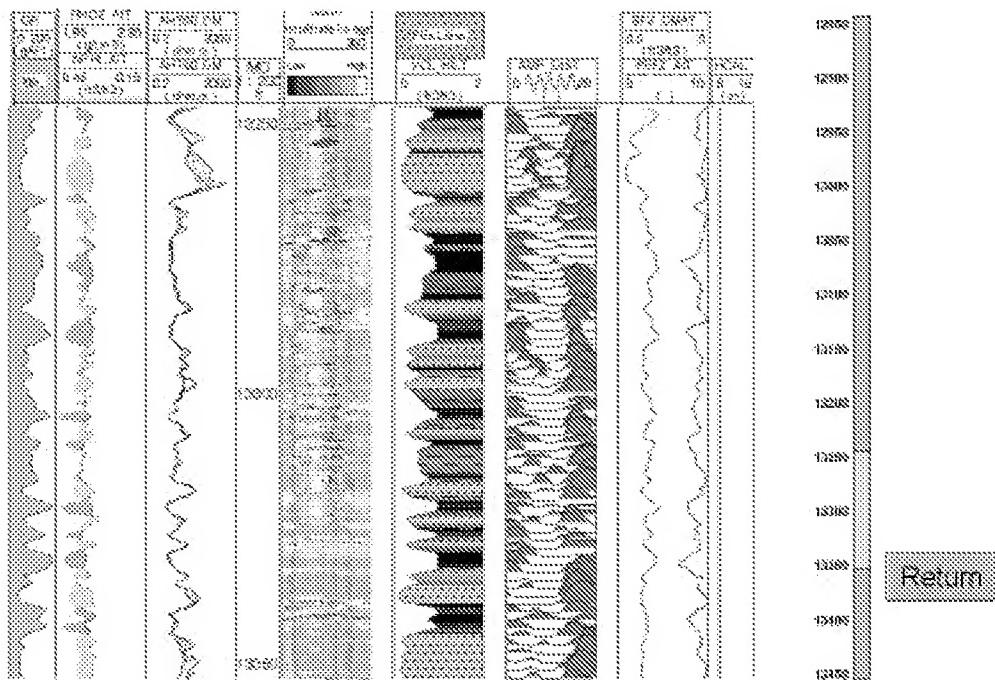
....select part of UBI display to enlarge......

UBI scale 1:20
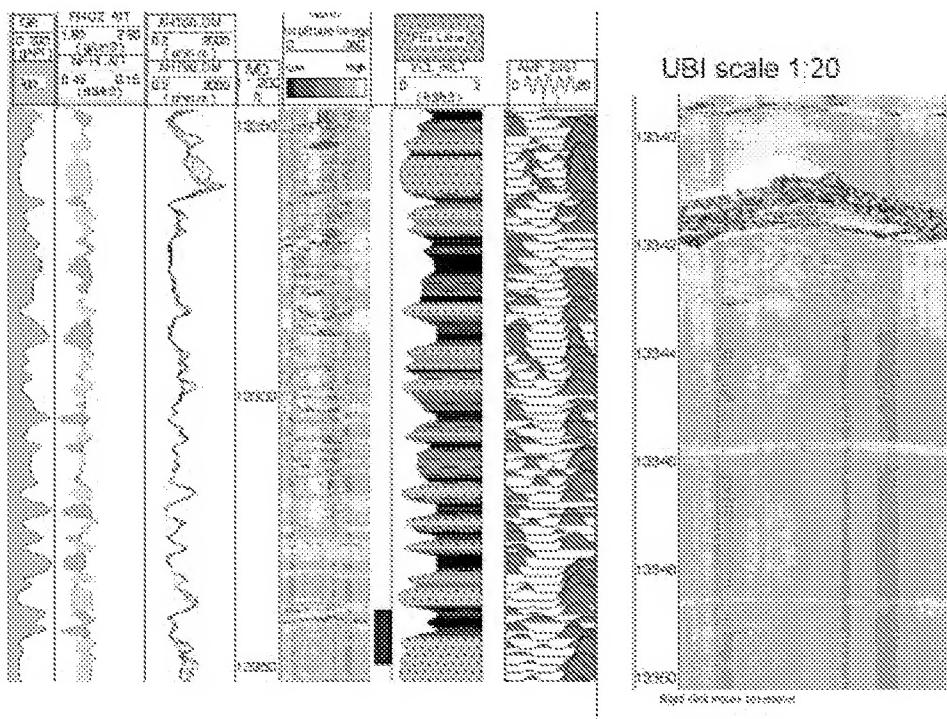
Back to main menu 'Other Data' tab......

Other Data

Please select the item for review:

Previous LWD logs/data
Previous Wireline data
Core and Mud log data
Well information

Finish

Press 'finish' button......

Client Toolbox

supplied by

Schlumberger

Helping you to make more of your data

TAB C

Job Planner - Menu Page

What the client/account manager needs to do:

- *select geological model and reservoir texture*
- *identify needs*
- *supply remaining background information*
- *select tools from recommended list*

What forms are then available?

- *Summary page*
- *Reservoir objectives*
- *Summary by hole size: 17.5", 12.25", 8.5"*
- *Summary by conveyance: LWD, WL - OH, WL - CH*

→ (select the blue text above to jump to the correct page when in presentation mode, then click "Back" button to return to this page)

First time users... Click here
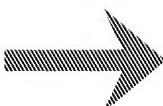
End show

For more information on Job Planner: review workflow, review product description

Some notes on this presentation.....

This is a first pass review on a possible "look and feel" for a Job Planner. There are no options to input information yet, so please do not attempt to do so!

You are recommended to review this in presentation mode, and navigate only by the hyperlink buttons from the Menu Page.

Use the "Back" button to return to the Menu Page.

Back

Geological model

(Select one to represent your target reservoir)

Clastic

Carbonate

deltaic

conglomerate

aeolian

unknown

Back

limestone

dolomite

basement
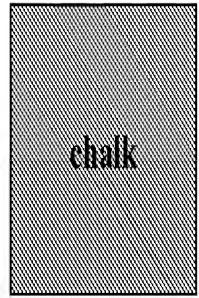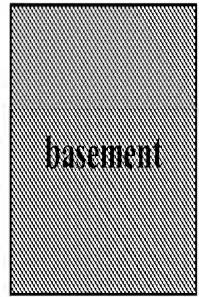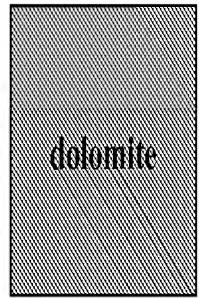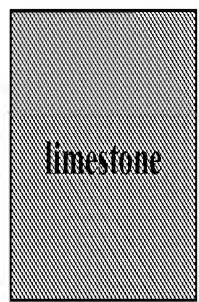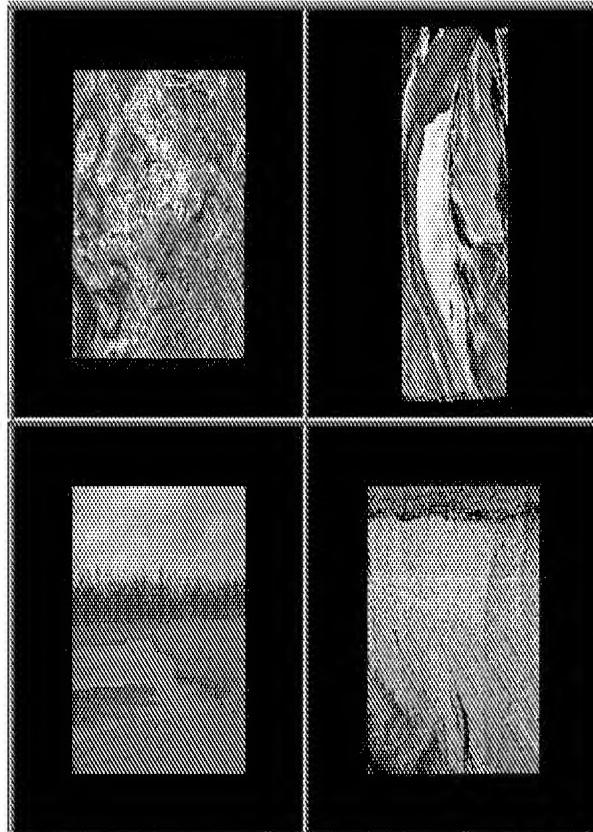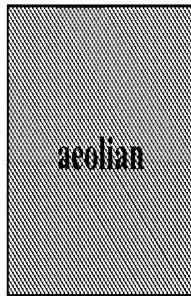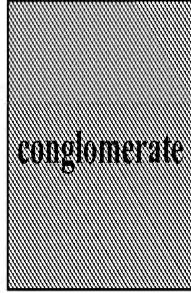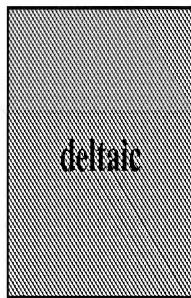
chalk
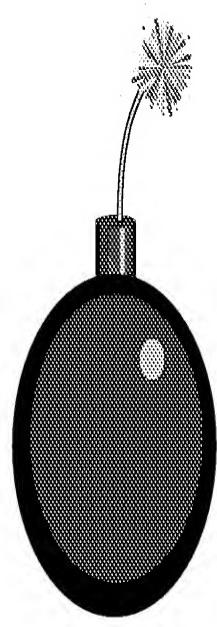
Note that selections are not activated yet......

....please navigate using the hyperlinks

Back

Reservoir texture

thin beds

reef

unconsolidated

high apparent dip

unknown

fractured

complex lithology

faulted

stressed

homogeneous
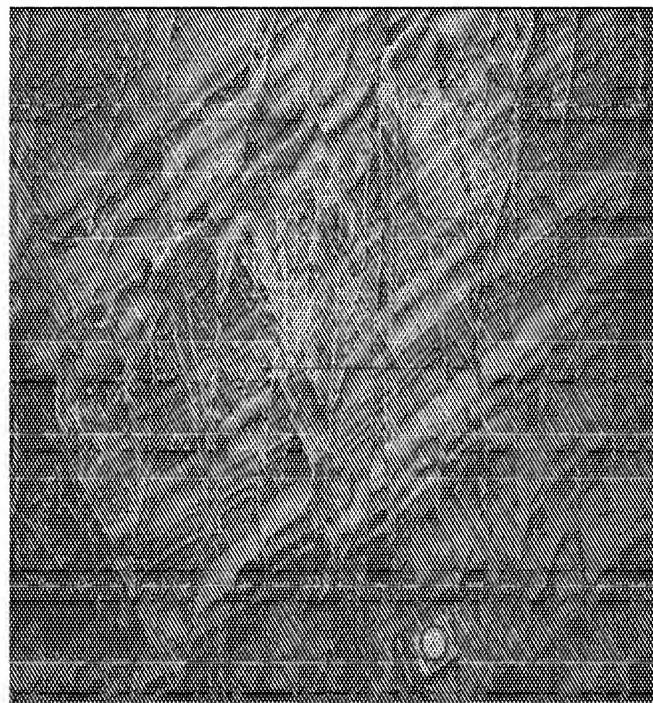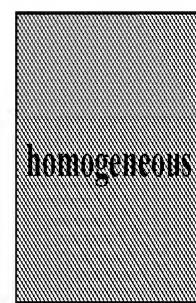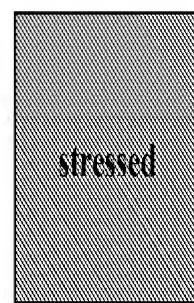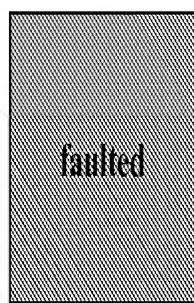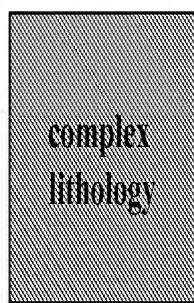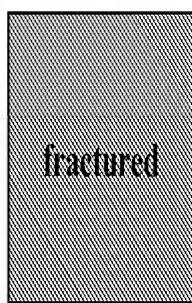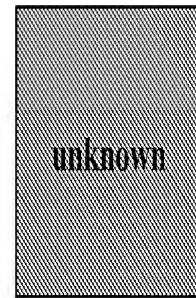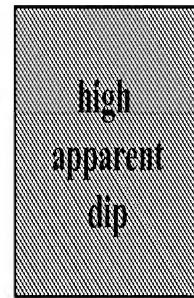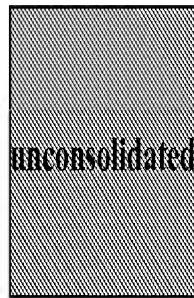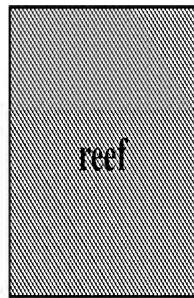
Back

(If known, select one or more that represents your reservoir.)
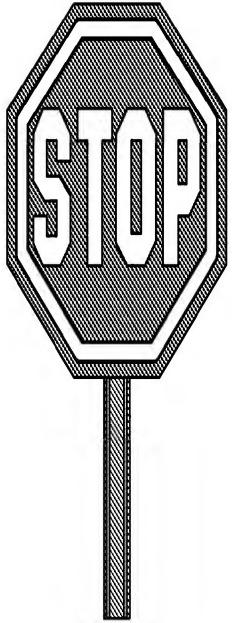
Note that selections are not activated yet......

....please navigate using the hyperlinks

Back

Possible Client needs from a data acquisition program

|			
Net pay	Faults/ fractures	Seismic calibration	
Producibility	Geomechanics	Hydraulic isolation	
Lithology	Pressure	Fluid redistribution	Others (specify)
Dips	Fluid type	Completion efficiency	Back
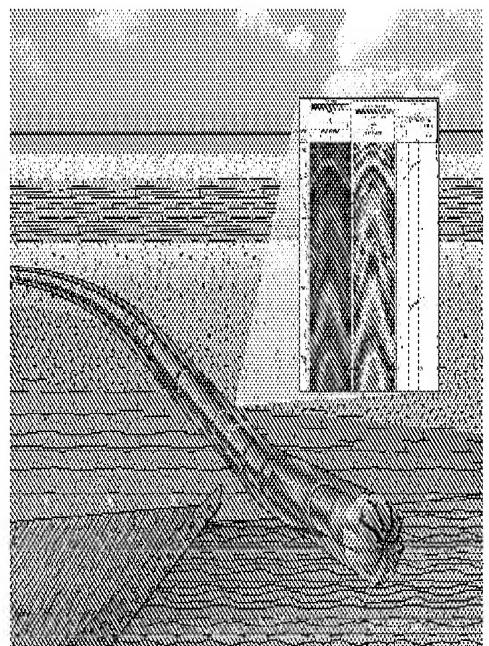
(Select one or more that represent your requirements.)
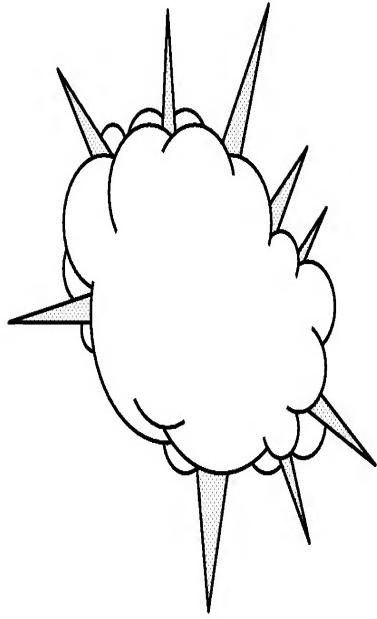
Note that selections are not activated yet......

....please navigate using the hyperlinks

Back

Other background information

Porosity range

Permeability range

Fluid properties

Pore pressure

**likely minerals**

Borehole environment

Hole profile

Other factors
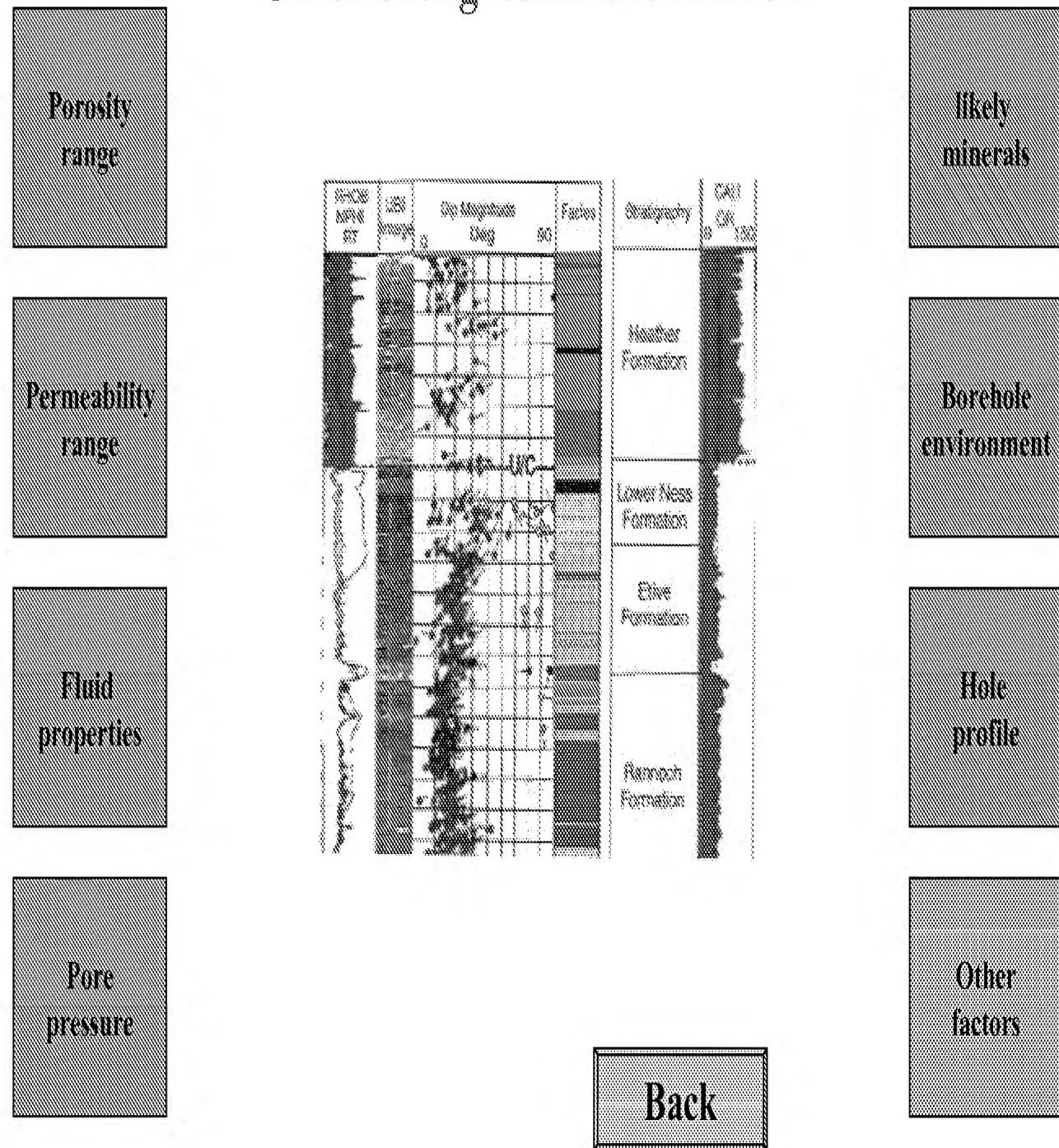
Back

(Where known, please fill out the information requested in each box.)
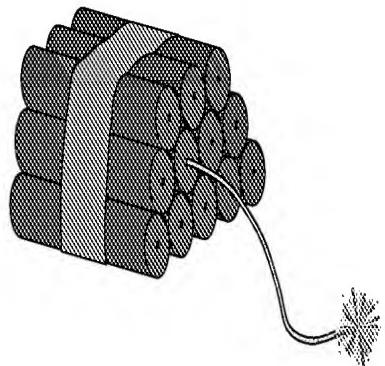
Note that selections are not activated yet......

....please navigate using the hyperlinks

Back
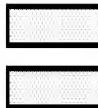
Well: ☐
Field: ☐

Job Planner - Summary

Client contact: ☐
SLB contact: ☐

	17 1/2"	12 1/4"	8 1/2"
mud type / weight	OBM / 9.1	OBM / 10.5	OBM / 12.5
max. dev. + DLS	15deg. / 2 deg/100'	45 deg. / 3 deg/100'	75deg. / 2 deg/100'
max. temperature	<250	<250	280
interval top/bot.	2100'-5300'	5300'-8200'	8200'-10450'
Primary objective	Time/depth calibration	Time/depth calibration	Net Pay Reservoir pressure Producibility
LWD sensors	CDR-GR	CDR-GR	ADN-CDR-ISONIC-GR
OH wireline	DIT-LDL-DSI-GR	PEX-AITH-DSI-GR	MDT-CMR-UBI (tlc) CBL-VDL-GR (12 1/4")
CH wireline	-	CBL-VDL-GR (to be run with 8 1/2" job)	CBL-VDL-GR (12 1/4", 8 1/2") Perfo. / PS platform
Comments	Run DITE only if any section not logged with CDR	Run AITH only if any section not logged with CDR	Try gravity decent to avoid TLC job.

Back

Well: ▨
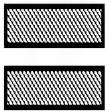
Field: ▨

Job Planner - Reservoir Objectives

	17.5"	12 1/4"	8 1/2"
interval top/bot.	2100'-5300'	5300'-8200'	8200'-10450'
Primary objectives	Time / Depth calibration; Detect near-surface gas (RT)	Time / Depth calibration Correlation, realtime	Net Pay (real time) Reservoir pressure Producibility No formation damage
Secondary objectives	Correlation with offset data;	Lithology Poissons ratio for geophys.	Lithology; Reservoir architecture Fluid type Time / Depth calibration; Cement evaluation >6000'
Measurement type (suggested by objectives)	Sonic density resistivity (realtime) GR	Vp +Vs from sonic density / neutron resistivity / GR (realtime) GR	Resistivity (realtime) Density / Neutron (realtime) NMR, Spectroscopy, Sonic, Imaging, Formation Tester Fluid analyser, Flowmeter TCP, CBL/VDL
Comments			

Back

Well: ▭
Field: ▭

Job Planner - 17.5"

Client contact: ▭
SLB contact: ▭

Measurement type
(taken from Reservoir Objectives)

Sonic
density
resistivity (realtime)
GR

Mud type / weight @ Bottom hole temperature. — OBM / 9.1 @ <250F

Max. deviation. + Dogleg severity — 15deg. / 2 deg/100'

Interval, top -->bottom — 2100'-5300'

	LWD	WL-OH	WL-CH
Sensors suggested	CDR-GR	DIT-LDL-DSI-GR	
Sensors chosen	CDR-GR	DIT-LDL-DSI-GR	
Comments	Run DITE only if any section not logged with CDR	Run DITE only if any section not logged with CDR	

Back

Well: ▭

Field: ▭

Job Planner - 12 1/4"

Client contact: ▭

SLB contact: ▭

Measurement type
(taken from Reservoir Objectives)

Vp +Vs from sonic
density / neutron
resistivity / GR (realtime)
GR

Mud type / weight @ Bottom hole temperature.	OBM / 10.5 @ <250F
Max. deviation. + Dogleg severity	45 deg. / 3 deg/100'
Interval, top -->bottom	5300'-8200'

	LWD	WL-OH	WL-CH
Sensors suggested	CDR-GR	PEX-AITH-DSI-GR	
Sensors chosen	CDR-GR	PEX-AITH-DSI-GR	
Comments		Run DITE only if any section not logged with CDR	
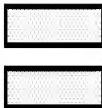
Back

Job Planner - 8 1/2"

Well: ▢
Field: ▢

Client contact: ▢
SLB contact: ▢

Measurement type
(taken from Reservoir Objectives)

Resistivity (realtime)
Density / Neutron (realtime)
NMR, Spectroscopy, Sonic
Imaging, Formation Tester
Fluid analyser, Flowmeter
TCP , CBL/VDL

Mud type / weight @ Bottom hole temperature.   OBM / 12.5 @ 280F

Max. deviation. + Dogleg severity   75deg. / 2 deg/100'

Interval, top -->bottom   8200'-10450'

	LWD	WL-OH	WL-CH
Sensors suggested	*ADN-CDR-GR*	*MDT-CMR-UBI (tlc)* *CBL-VDL-GR (12 1/4")*	*TCP -5"* *PSP - surface readout*
Sensors chosen	*ADN-CDR-ISONIC-GR*	*MDT-CMR-UBI (gravity)* *or* *MDT-CMR-UBI-DSI (tlc)* *CBL-VDL-GR (12 1/4")*	*TCP - 5"* *PSP - memory*
Comments	ISONIC demonstration - do not charge if w/l log also run	ISONIC demonstration - do not charge if w/l log also run	PSP on slickline, as deep as possible. (1p22 cable may have problems going down.

Back

Job Planner - LWD

Well: ▭
Field: ▭

Client contact: ▭
SLB contact: ▭

hole size (casing)	17.5" (13 3/8)	12 1/4" (9 5/8)	8 1/2" (7)
Mud type / weight @ temp.	OBM / 9.1 @ <250F	OBM / 10.5 @ <250F	OBM / 12.5 @ 280F
Max. dev. + Dogleg	15deg. / 2 deg/100'	45 deg. / 3 deg/100'	75deg. / 2 deg/100'
Interval top -->bottom	2100'-5300'	5300'-8200'	8200'-10450'
Measurement type (from Reservoir objectives)	Sonic density resistivity (realtime) GR	Vp +Vs from sonic density / neutron resistivity / GR (realtime) GR	Resistivity (realtime) Density / Neutron (realtime) NMR, Spectroscopy, Sonic Imaging, Formation Tester Fluid analyser, Flowmeter TCP , CBL/VDL
LWD sensors (suggested)	CDR-GR	CDR-GR	ADN-CDR-GR
LWD sensors (chosen)	CDR-GR	CDR-GR	ADN-CDR-ISONIC-GR
Comments	Run DITE only if any section not logged with CDR		ISONIC demonstration - do not charge if w/l log also run

Back

Job Planner - WL(OH)

Well: ☐
Field: ☐

Client contact: ☐
SLB contact: ☐

Hole size (casing)	17.5" (13 3/8)	12 1/4" (9 5/8)	8 1/2" (7)
Mud type / weight @ temp.	OBM / 9.1 @ <250F	OBM / 10.5 @ <250F	OBM / 12.5 @ 280F
Max. dev. + Dogleg	15deg. / 2 deg/100'	45 deg. / 3 deg/100'	75deg. / 2 deg/100'
Interval top -->bottom	2100'-5300'	5300'-8200'	8200'-10450'
Measurement type (from Reservoir objectives)	Sonic density resistivity (realtime) GR	Vp +Vs from sonic density / neutron resistivity / GR (realtime) GR	Resistivity (realtime) Density / Neutron (realtime) NMR, Spectroscopy, Sonic Imaging, Formation Tester Fluid analyser, Flowmeter TCP , CBL/VDL
WL sensors (suggested)	DIT-LDL-DSI-GR	PEX-AITH-DSI-GR	MDT-CMR-UBI (tlc) CBL-VDL-GR (12 1/4")
WL sensors (chosen)	DIT-LDL-DSI-GR	PEX-AITH-DSI-GR	MDT-CMR-UBI (gravity) or MDT-CMR-UBI-DSI (tlc) CBL-VDL-GR (12 1/4")
Comments	Run DITE only if any section not logged with CDR	Run DITE only if any section not logged with CDR	ISONIC demonstration - do not charge if w/l log also run

Back

Well: ▭

Field: ▭

Job Planner - WL(CH)

Client contact: ▭

SLB contact: ▭

Hole size (casing)	17.5" (13 3/8)	12 1/4" (9 5/8)	8 1/2" (7)
Mud type / weight @ temp.	OBM / 9.1 @ <250F	OBM / 10.5 @ <250F	OBM / 12.5 @ 280F
Max. dev. + Dogleg	15deg. / 2 deg/100'	45 deg. / 3 deg/100'	75deg. / 2 deg/100'
Interval top -->bottom	2100'-5300'	5300'-8200'	8200'-10450'
Measurement type (from Reservoir objectives)	Sonic density resistivity (realtime) GR	Vp +Vs from sonic density / neutron resistivity / GR (realtime) GR	Resistivity (realtime) Density / Neutron (realtime) NMR, Spectroscopy, Sonic Imaging, Formation Tester Fluid analyser, Flowmeter TCP , CBL/VDL
WL-CH sensors (suggested)			TCP -5" PSP - surface readout
WL-CH sensors (chosen)			TCP - 5" PSP - memory
Comments			PSP on slickline, as deep as possible. (1p22 cable may have problems going down.

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Click on particular Recommended Tool to make selection, or leave blank.

Client needs in 8. 5" hole ⟹ Recommended Sensor types ⟹ Recommended Tools ⟹ Selected Tools

	LWD	WL OH	WL CH	
Resistivity	CDR / RAB	ATT / DIT		CDR
Density	ADN / CDN	LDL / HLD		ADN
Neutron	ADN / CDN	APS / CNL	APS / CNL	ADN
Shear sonic	ISO /	DSI / SDT	DSI / SDT	ISO
Magnetic resonance		CMR		CMR
Imaging	ADN /	UBI / FMI		UBI
Formation Tester		MDT / RFT	CHR /	MDT
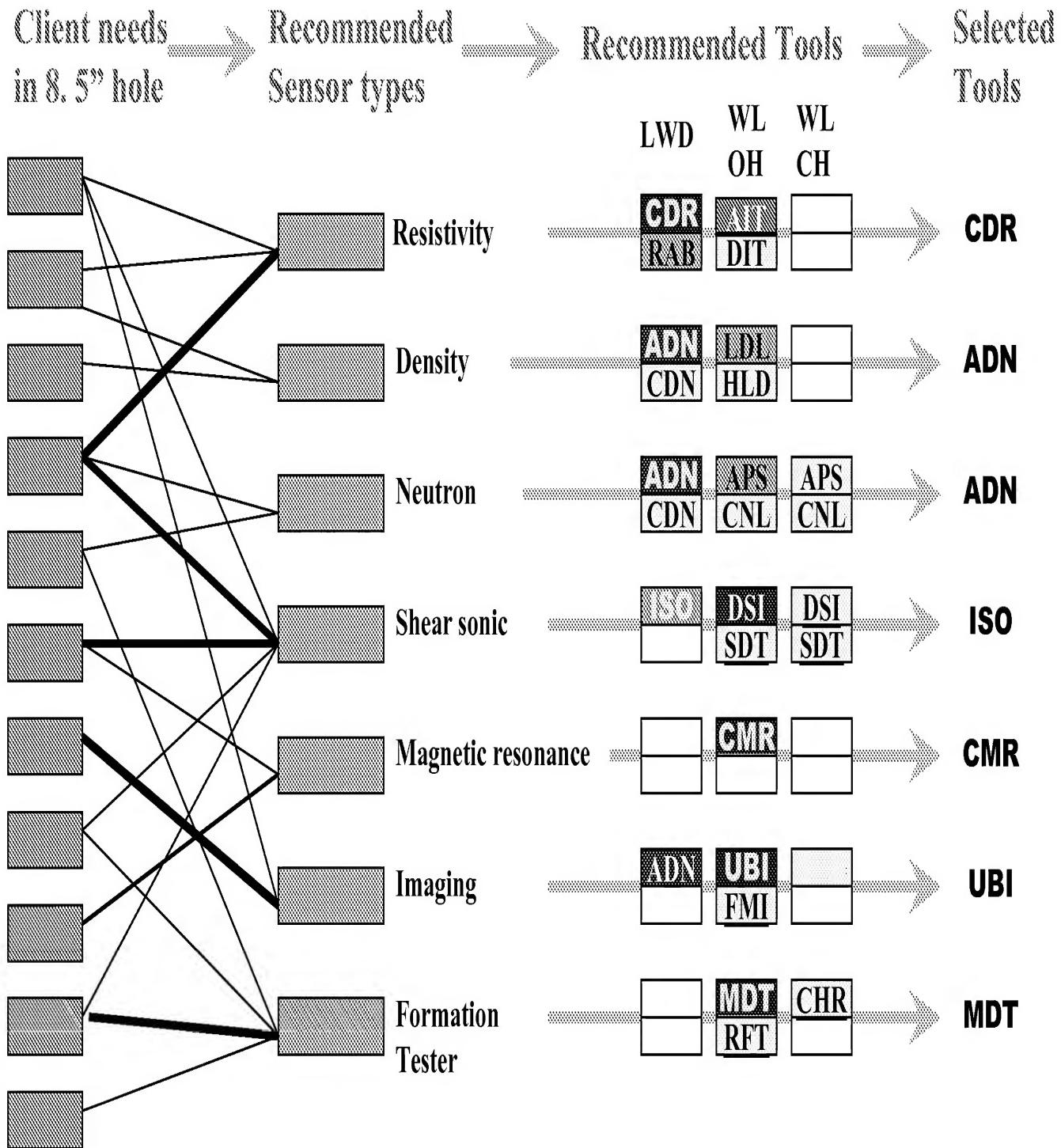
Recommendation "level" ⟶ | CDR | ATT | RAB | DIT | ☐ | Client selection | Back
| 4 | 3 | 2 | 1 | 0 |
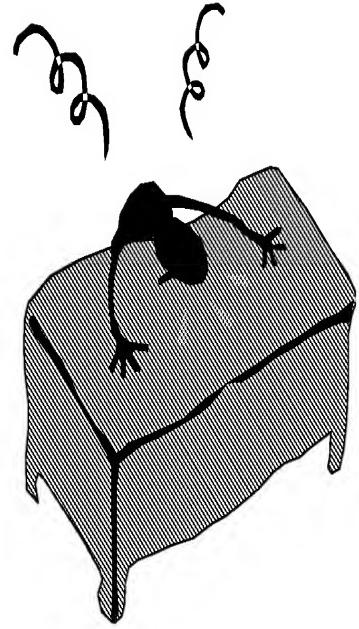
Note that selections are not activated yet......

....please navigate using the hyperlinks

Back

Objective of Job Planner:

To identify what the Client(s) requirements are, and match them to an acquisition program.
Link the logs acquired back into an Answer Product deliverable (typically a composite log)

For the Client this ensures a 'fit for purpose' acquisition program that has robust support (if queried by his management!)

For SLB this ensures we do not overlook any opportunity to increase revenue.

Features of Job Planner:

4 Stages of job planning suggested (see next page)....use *graphical* interactive displays where possible. We should also be able to load a profile (eg North Sea jurassic, HPHT, Saudi Khuff, etc.)
 or a previously saved Job Planning session.

Illustrated help on choices should be made available at any stage.

A local list of contacts to discuss technical issues should also be made available

An audit trail should exist for the suggested logging program. (ie. why did the planner suggest DSI? -
if requested, the program can show a 'textbook' example linking the client need to the suggested logging program.)

▷
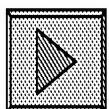
4 suggested stages of Job Planning:

1

Identify basic reservoir lithology
- (deltaic, conglomerate, aeolian, chalk, limestone, dolomite, basement)
Identify basic reservoir texture
- (thin beds, fractured, high dip, reef, complex lithology, stressed,unconsolidated)
Identify likely reservoir features
- porosity range, fluid properties, pressure, permeability

2

Review what client needs to know in each hole size.
For example, across the reservoir section, s/he needs:

- net pay before projected TD is reached
- reservoir pressure
- sonic calibration data
- zonal isolation confirmation

3

Suggest sensor types that could answer these needs.
For example: Density, Neutron, Resistivity, Sonic, Formation pressure,Check shot...
Sensor type choice should be *independent* of conveyance or open/cased hole environment.

4

Translate this list to a recommended logging program, taking into account the environmental
conditions (mud, hole angle, size, temperature, hole condition) giving for example:
ADN, CDR, ISONIC (Logging While Drilling)
UBI, MDT, CMR (Wireline)
Check shot, CBL-VDL (Cased Hole)
Use individual Tool Planners where available to assist parameter selection.
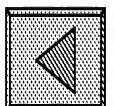
Remember, allow the client the final choice of the actual logging program!

Menu

Workflow summary

Client needs → **Sensor types** → **Recommended Tools** → **Selected Tools** → **Answer Products (Composite logs?) addressing client needs.**

	LWD	WL OH	WL CH		LWD	WL OH	WL CH	
Resistivity	CDR RAB	AIT DIT		→	CDR			
Density	ADN CDN	LDL HLD		→	ADN			
Neutron	ADN CDN	APS CNL	APS CNL	→	ADN			
Shear sonic	ISO	DSI SDT	DSI SDT	→	ISO			
Magnetic resonance		CMR		→		CMR		
Imaging	ADN	UBI FMI		→		UBI		
Formation Tester		MDT RFT	CHR	→		MDT		

Knowledge of interpretation

Knowledge of tool, environment and pricing

Client selection

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TAB D

Classic / Ideal service

Write logging program

Identify needs

Classic

Acquire data

Ideal

Deliver Data

Satisfy needs
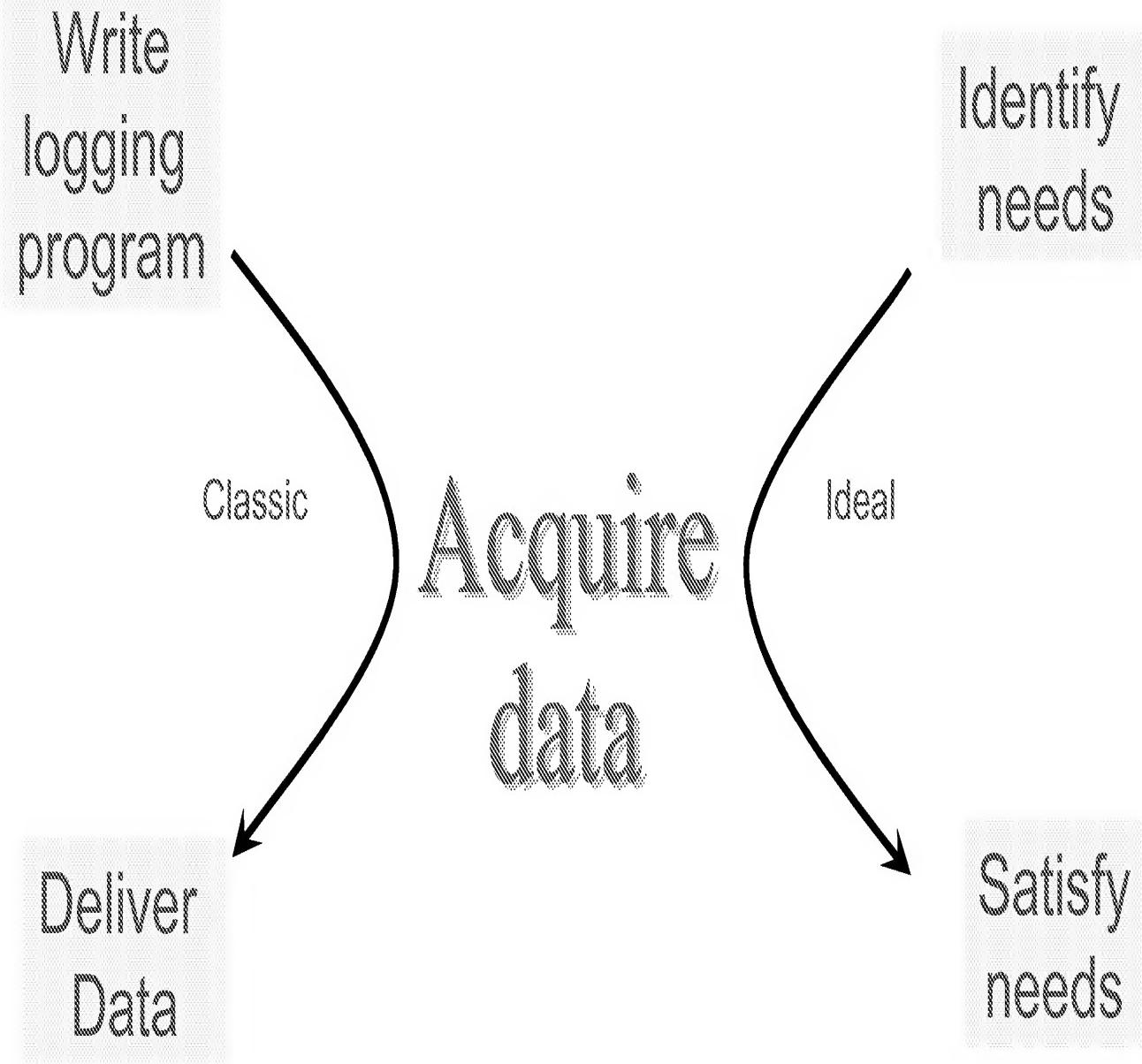
The role of the Answer Process

	Triple combo	Dipole sonic	CMR	ECS	MDT	FMI
Hydrocarbon pore volume	●	·	●	·	●	·
Geomechanics	●	●	·	●	●	●
Producibility	●	●	●	●	●	·
Reservoir architecture	●	·	●	●	●	●

Focus on the application, not the service.
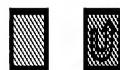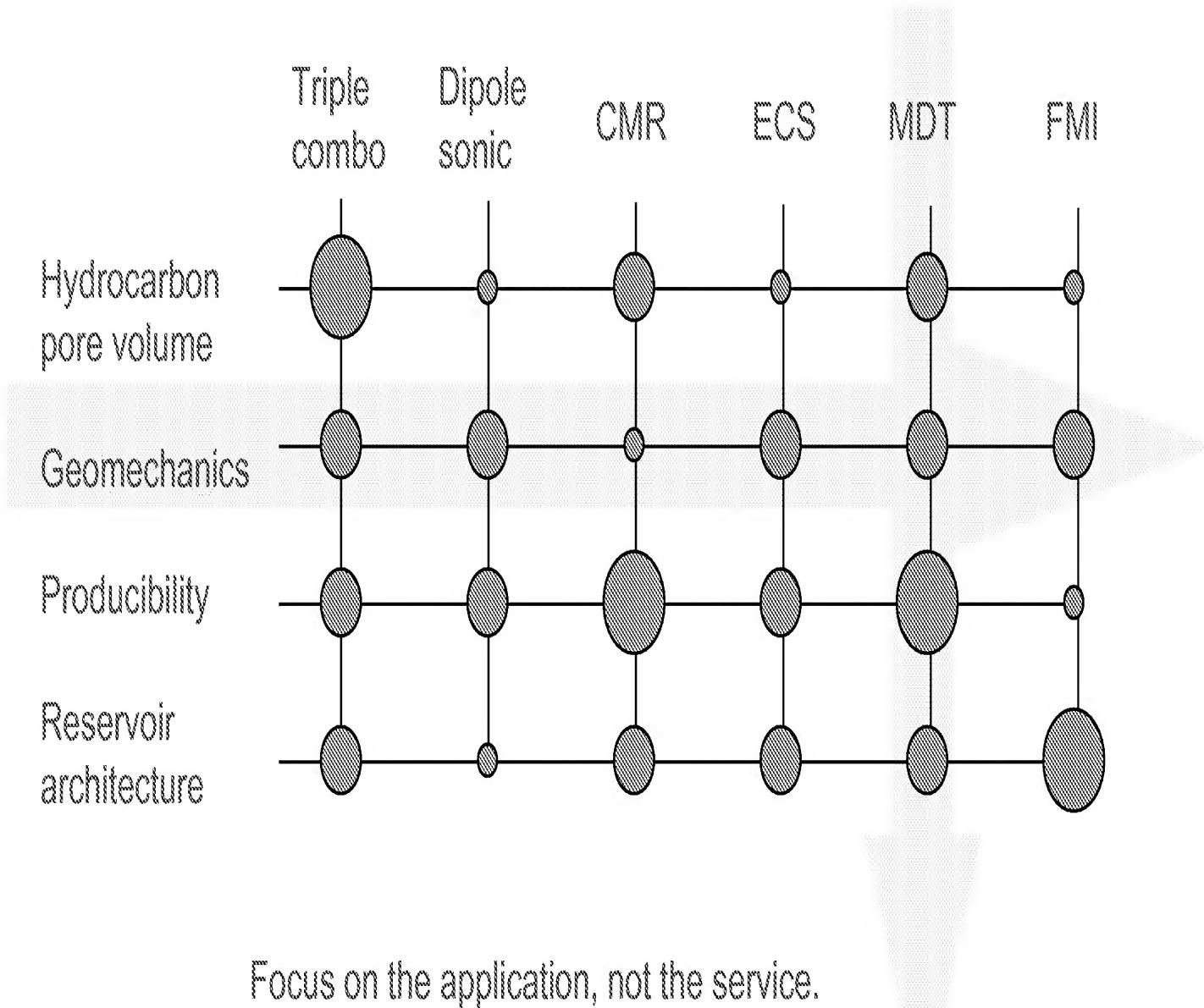
Practical implementation

Software tools can help in this transformation of

needs

⬇

sensors choice

⬇

satisfying needs
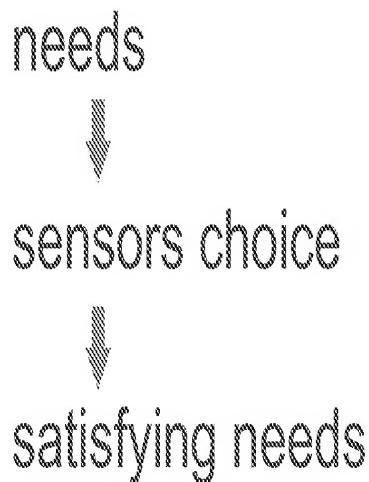
Brief demo of:

Tool Advisor (sensor selection "wizard")

Interactive Composite Display

Answer Process Workflow - scenario

Tool Advisor	Tool Planner	Horizon	Toolbox + Composites	FE Office

What type of sensor? Set sensor parameters Acquire raw data Reformat raw data to address needs Integrate information into Client Workflow

Objective....
Assimilate all useful data into Client workflow, where it
can immediately assist in decision making.
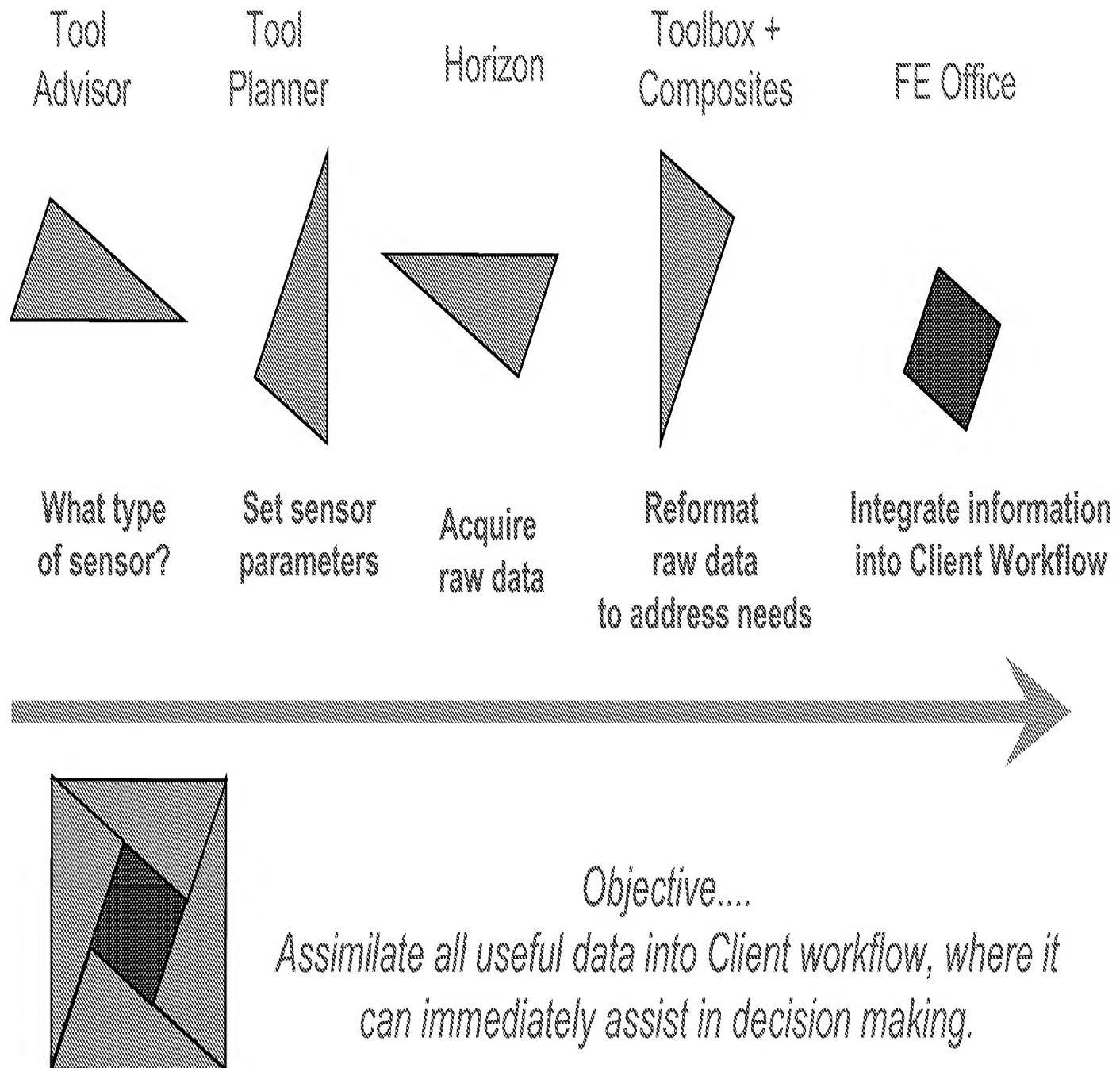
Schlumberger

Tool Advisor
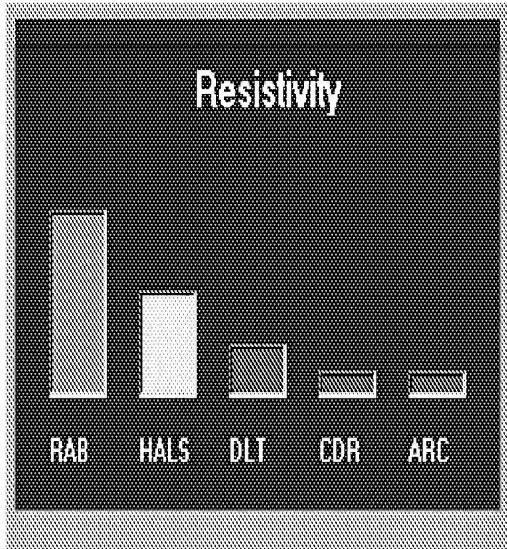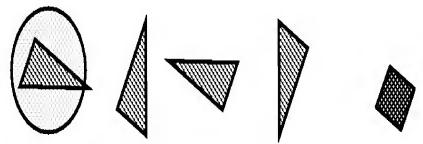
- Reinforces logging tool selection

- Uncovers missed opportunities for further sensors

- Advertises the range of sensors available

- Consolidates the link between LWD and WL

- Provides lead into "Tool Planners"

Tool Planner
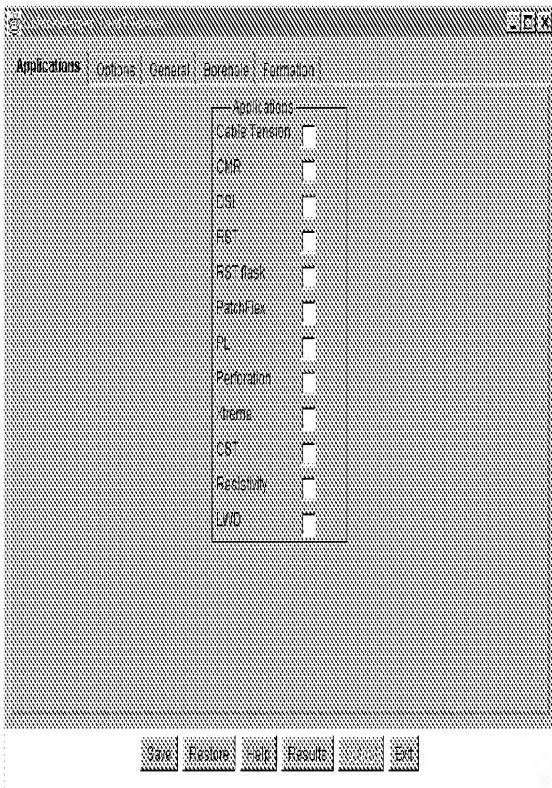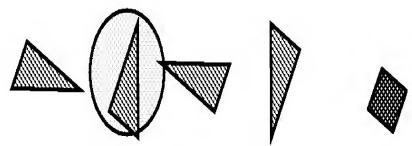
Acquisition Parameters

Tool mode	Sandstone depth	
Wait time	1.3	s
Number of echoes	1200	
Echo spacing	200.0	us
Logging speed	584.4	ft/hr
Vertical resolution	18.0	in
Repetition	1	
Downhole stacking	3	

- Optimize acquisition parameters of selected sensors

- Transfer parameter choices into Horizon Acquisition system

Horizon

Horizon Wireline Vision

Workflow Integration
- Pre-job planning
- Acquisition
- Product delivery
- Post-job reporting

Efficient Product Generation
- "Done When You're Out of the Hole"

Flexible/Visible Operation
- Interactive data views
- Visualized Tool Operation and Conveyance
- Wellsite Plan/Checklist

Underlying Database
- Applications can use all available data
- Data Quality built in (CDDI)

Pre-Job Planning

Clients and Sales Engineers

Job Specification

Field Service Mgr.

Field Engineer

Equipment View

Multiple UI Views WellView

Wellsite Plan/Checklist

Well-site Logging Activities

Integrated Application Controls

Horizon Wireline System

"On-the-fly", Interactive Data Views

Client Witness (office well-site trailer, etc.)

Remote Logging Activities

Field Service Mgr.

Digital Product Composer

Automated Product Generation

Graphical Product Composer

Job Record/ Client Product

Schlumberger   Austin Product Center   Logging Tool Systems

Horizon is part of the delivery process.

It must be designed to easily receive information (e.g. from tool Planners) and then pass on information (e.g. data and graphics to Client Toolbox and FE Office)

Schlumberger

Client Toolbox
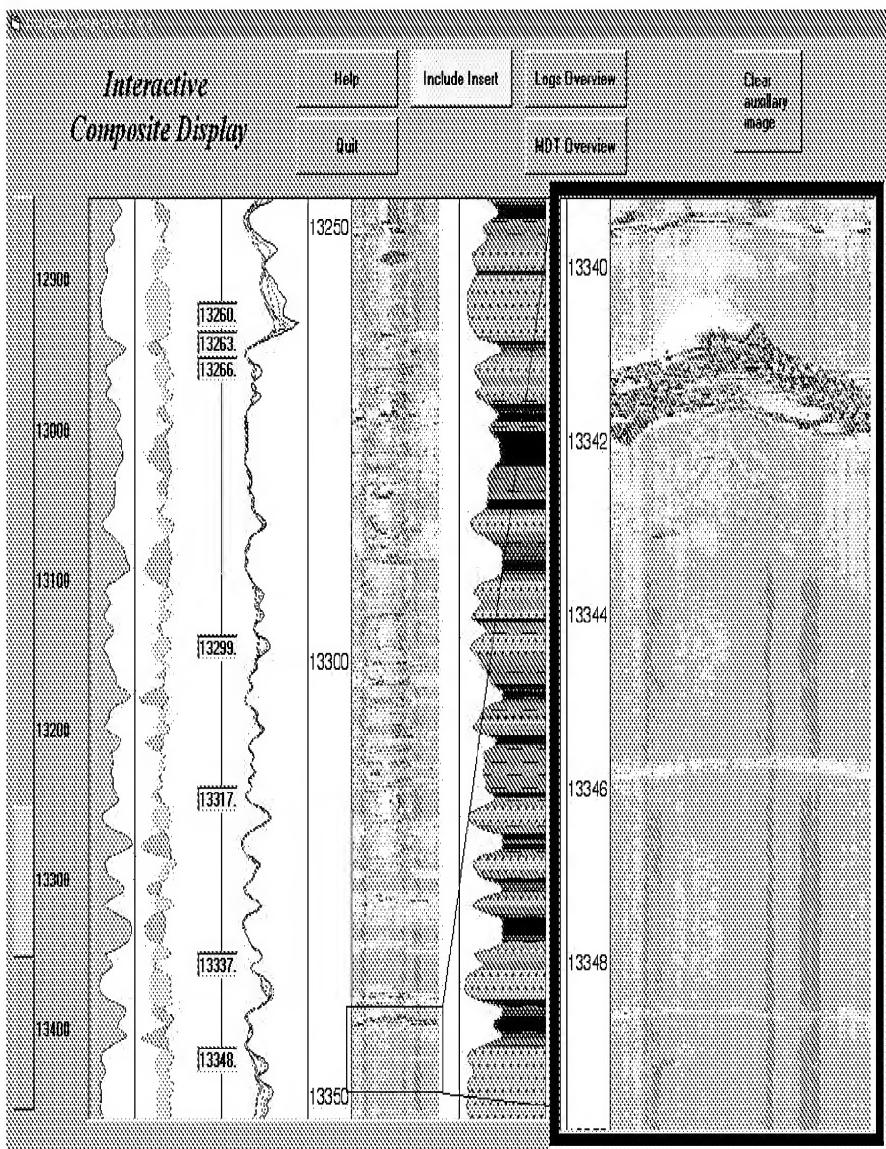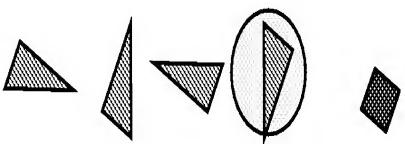
Toolbox 1.0 already underway, providing data and graphical manipulation tools for DLIS and PDS.

Next stage needs to address composite log delivery, possibly interactive products delivered on CD/DVD.

FE Office
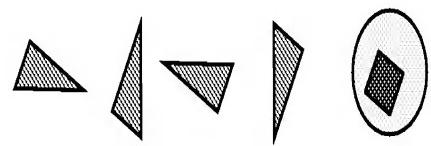
We should not always rely just on our technological "edge" to remain competitive, we also need to communicate it effectively.

A powerful way to achieve this is to provide the interpretation software environment in which the data is delivered.

This does not happen today because:
- *our interpretation platform is not widely available*
- *our software usability is poor and inefficient*

FE Office is designed to address this:

Formation Evaluation Office
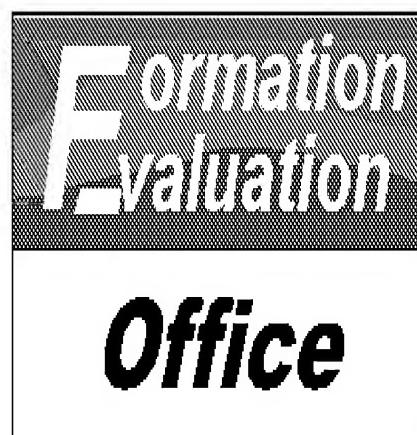
Answer Products composite example

GR 0 100 gapi	Pef 0 20 b/e	Temp 150 160 deg F	Cal 6 16 inch.	Fluid loss 0 5 bbls/m	LLD LLG LLS 0.2 20	FMI -180 +180 deg. (dark = cond.)	Stoneley waveform	Energy: lost reflected	Stoneley Reflection

9300

9350
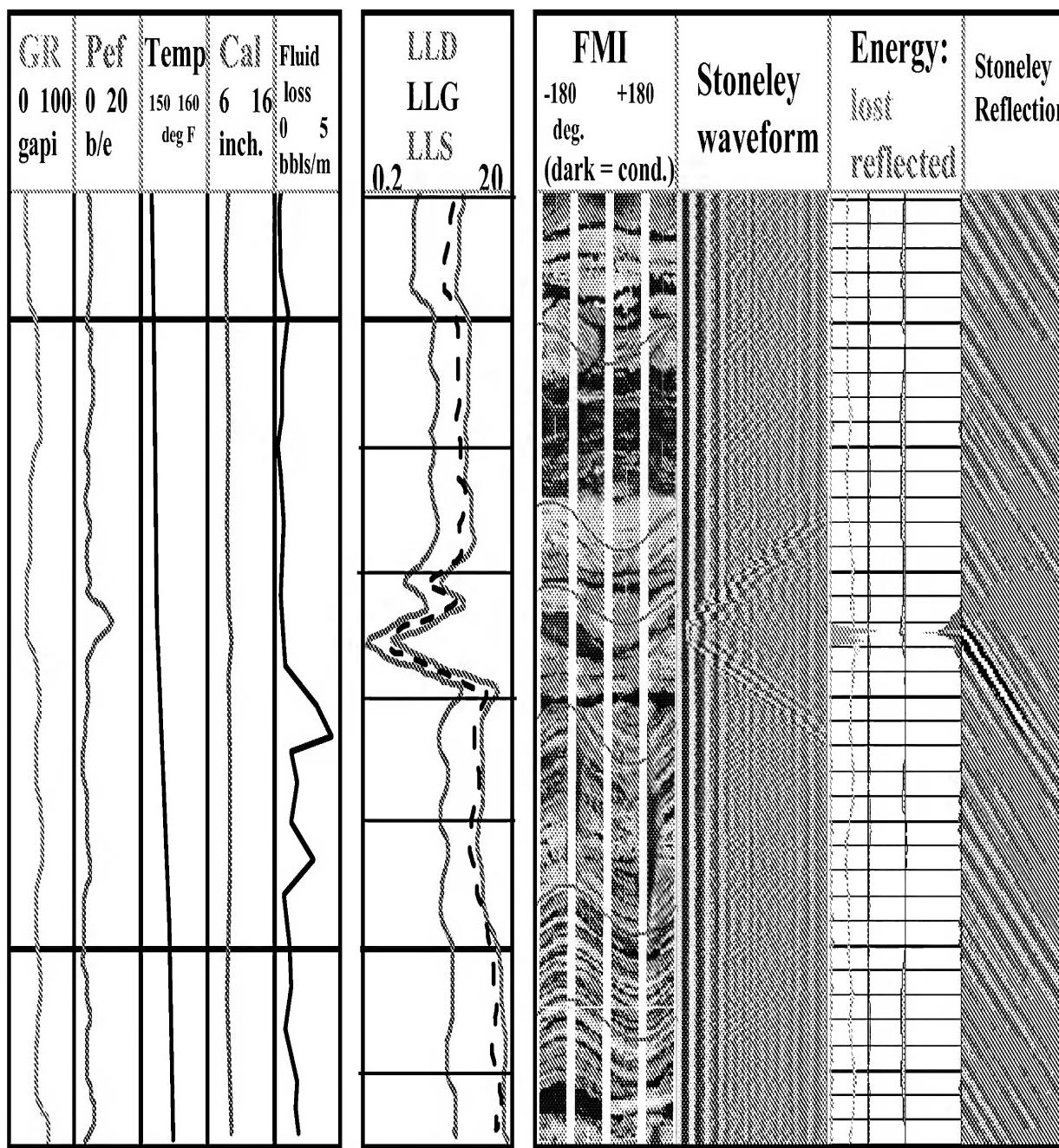
Fracture detection composite

Answer Product Delivery - the future
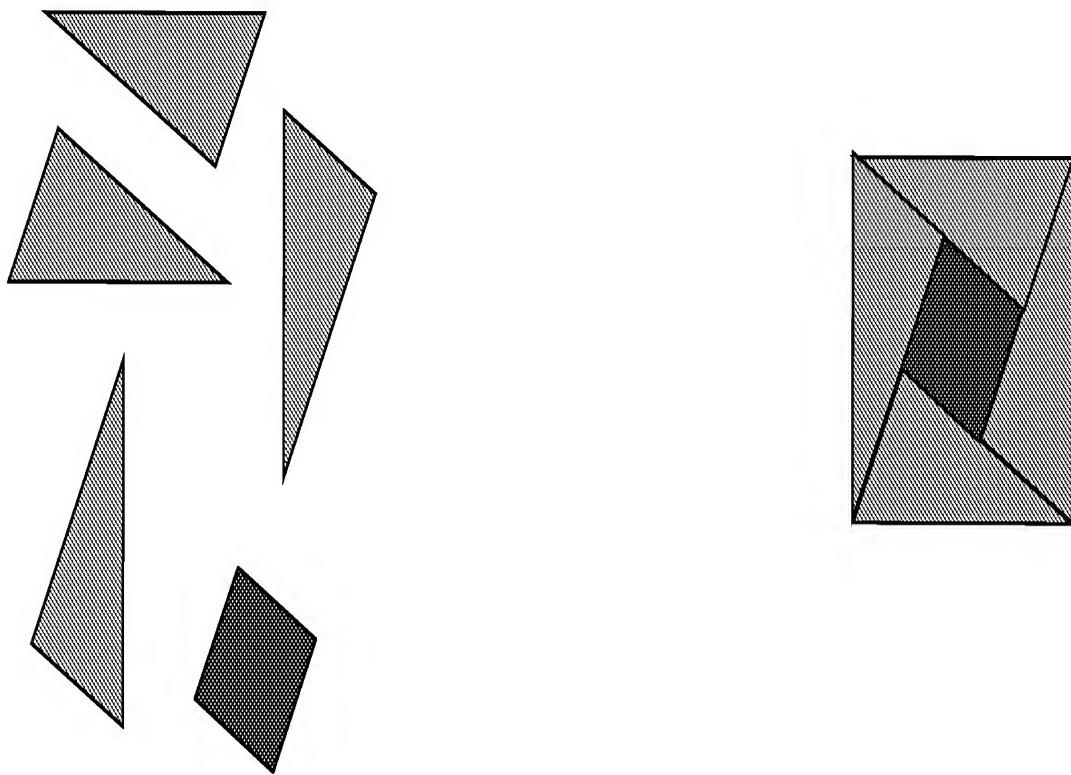
Separate initiatives......   .....or integrated approach?
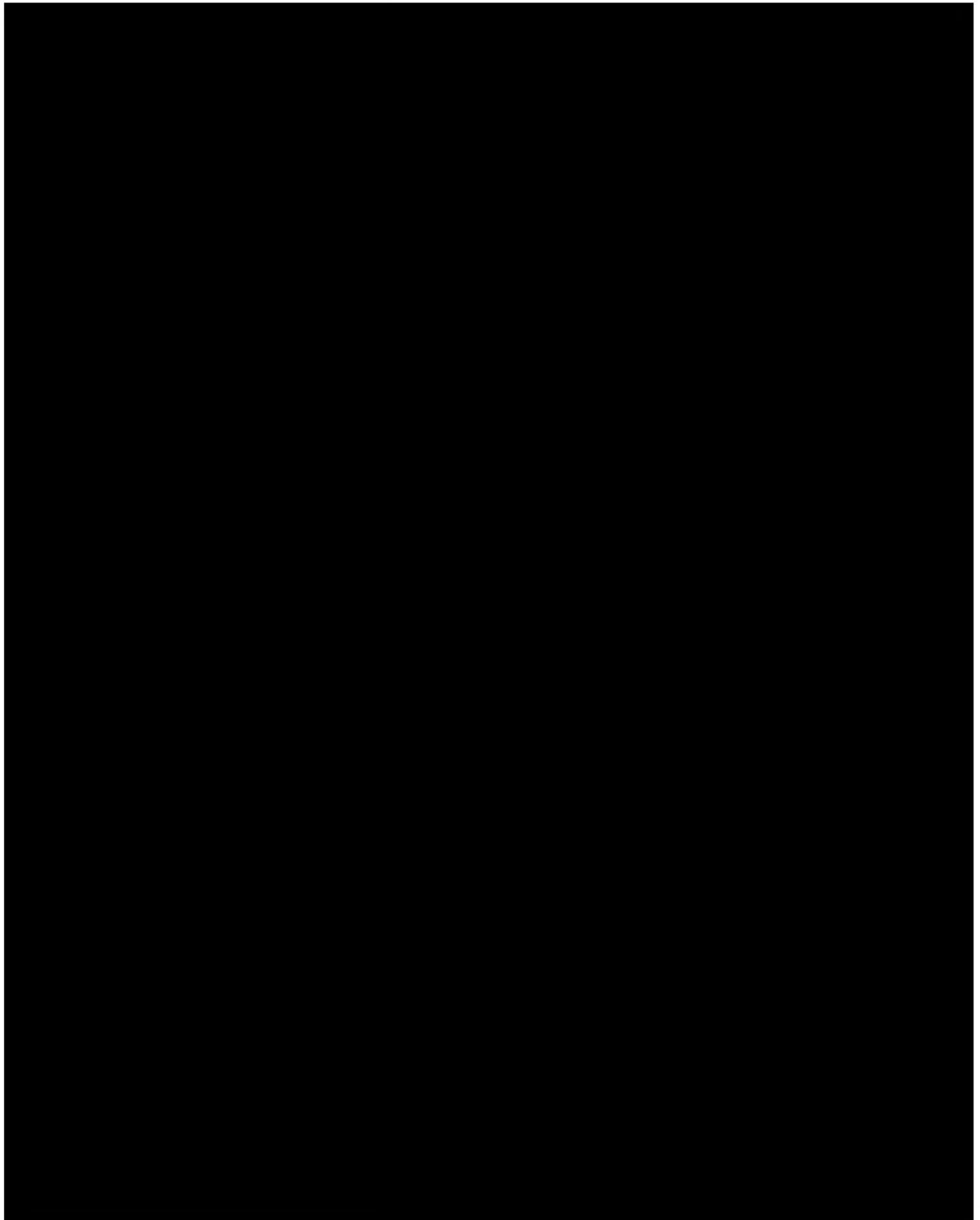
Features of a good answer product

- Available promptly

- Addresses client need

- Presentation / computation easy to modify

- No (obvious) incremental cost

- Widely accessible

- Easy to transfer results to client workflow

- Contribution of sensors clearly visible

Deliverables

A clients perception of our data may be totally defined by the Answer Product delivered.

Answer Product

We should regain control over the way our clients see our data.

TAB E

Service Advisor - Overview

Purpose of Service Advisor

Enhance WL and LWD acquisition revenue.

Who can use it?

Our sales, marketing, ID, FSMs, Field engineers. (and possibly clients.)

What does it do?

Captures the clients requirements and matches them to a suite of LWD or Wireline tools

Service Advisor - Overview (2)

What other information is needed apart from client needs?

Any extra information about the reservoir and operating environment is used to improve the recommended list of logging tools.

Why do we need such a program?

The decision making information is collected in one place.
Ensures that both the client and ourselves maximise the value of SLB service.

Service Advisor - Overview (3)

Is it available today?

A working program is available to demonstrate this concept.
*The program is written in VB.*

However a review process must
be carried out before distribution.
Further info: contact Jim White

Snapshots of screen are shown in
following pages.

Sample screen - select Client Needs (Logging Objectives)
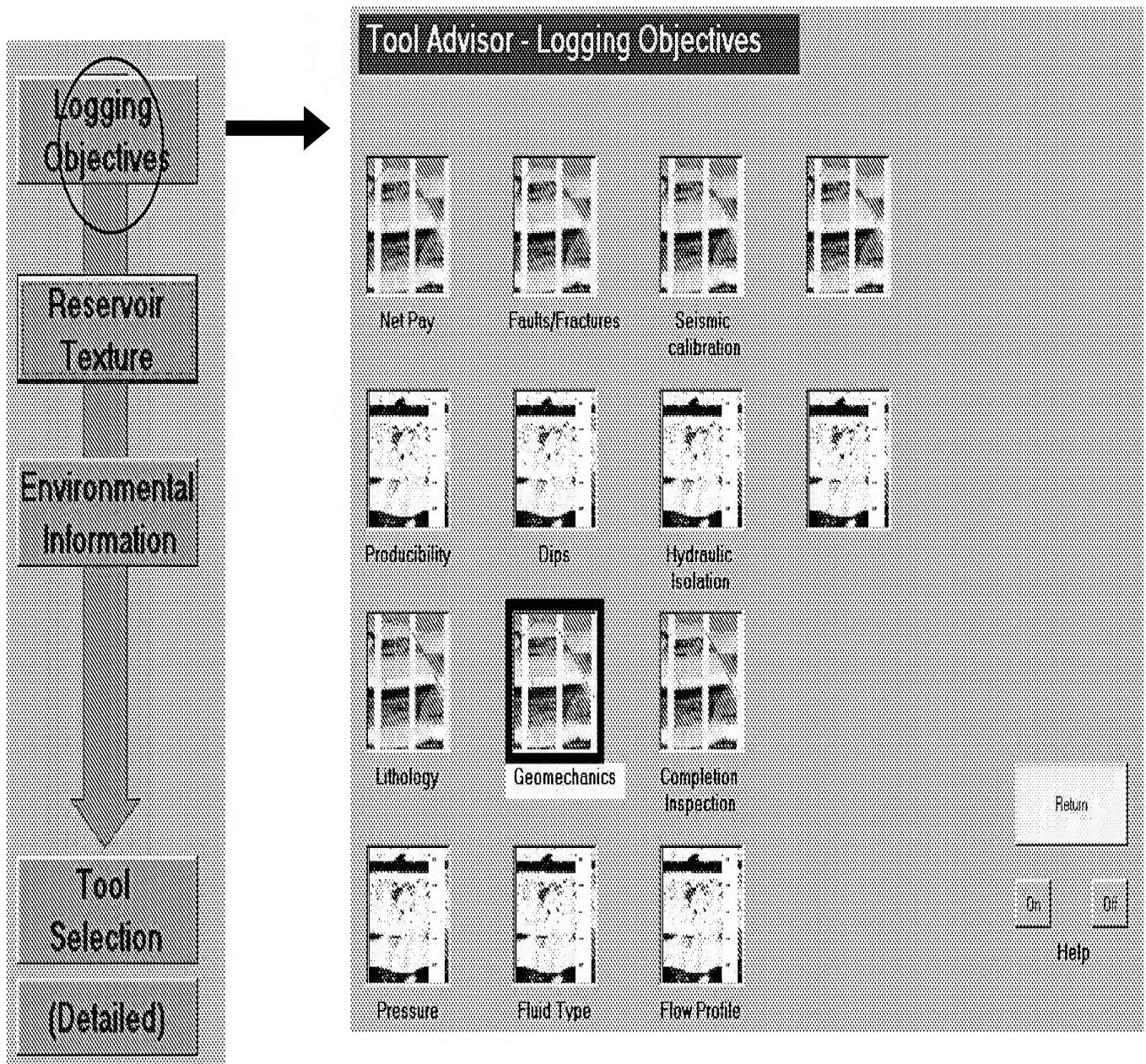
Select what the client wants to get out of the data.... (here Geomechanics)

Sample screen - select Reservoir Texture

Logging Objectives

Reservoir Texture

Environmental Information

Tool Selection (Detailed)

Tool Advisor - Reservoir Texture

Thin Beds

Complex Lithology

High Apparent Dip

Reef Structure

Stressed Rock

Unconsolidated

Return

Refresh

Help

On   Off
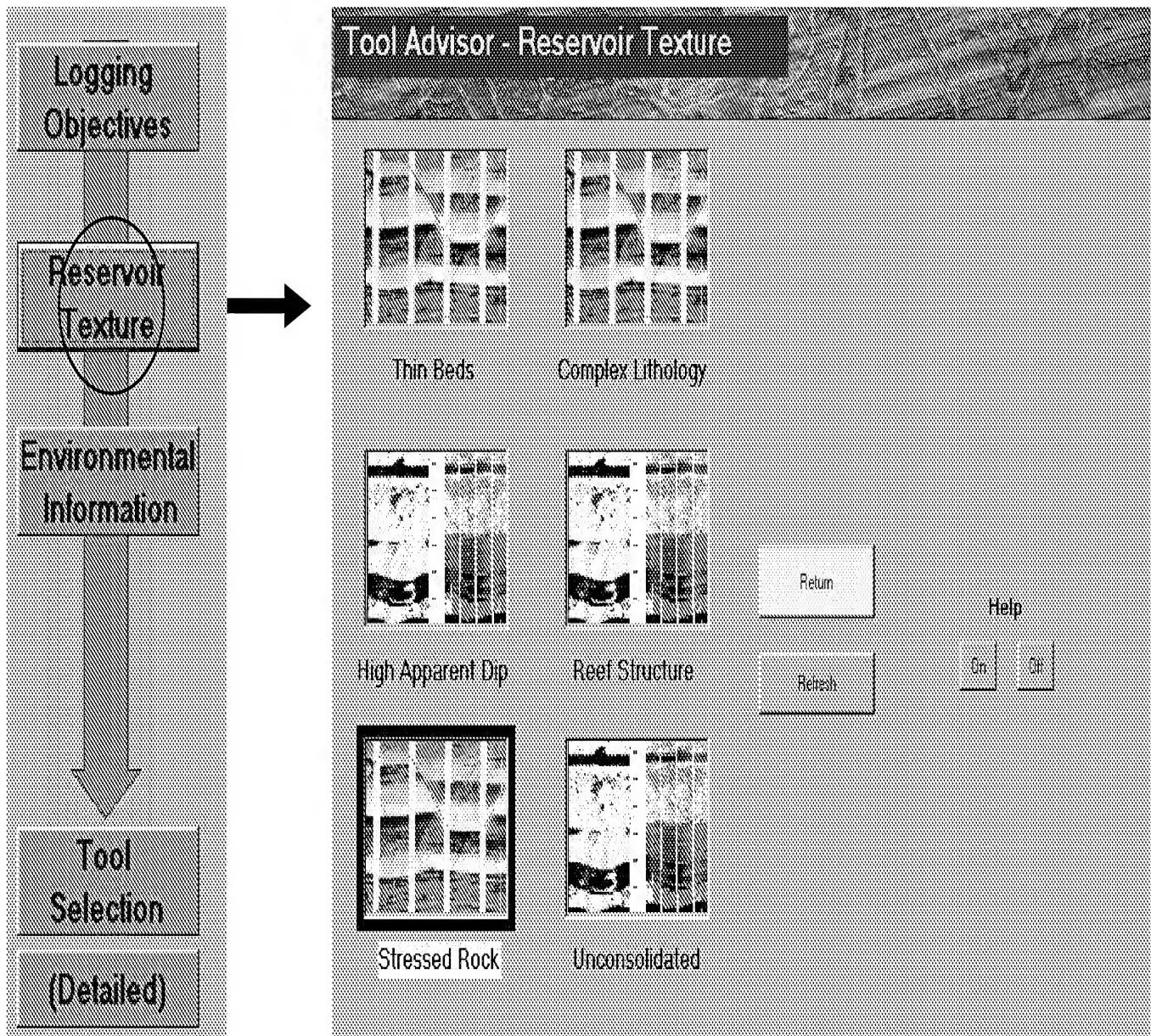
Select any additional information on reservoir texture....
(For example, we know the rock is subjected to unbalanced stresses)

Sample screen - select Environment
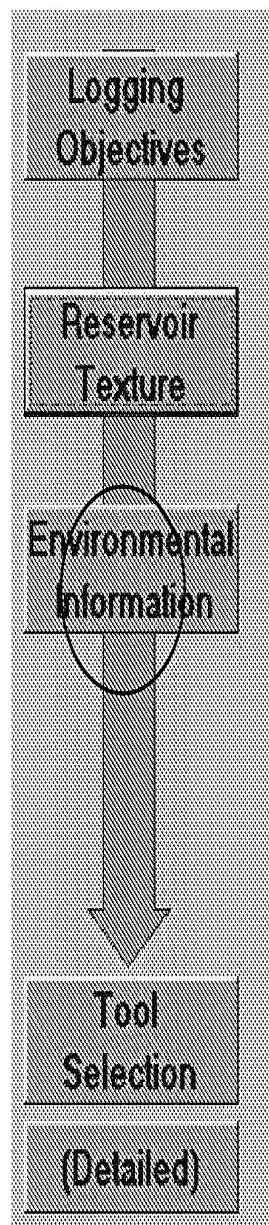
Tool Advisor - Environmental Effects

Logging Objectives → Reservoir Texture → Environmental Information → Tool Selection (Detailed)

Borehole Diameter: 4"-6", 8"-12", 12"-16", 6"-8", >16" — d

Mud Weight — ppg

Borehole Temperature: 400F - 500F, 350F - 400F, 300F - 350F, 250F - 300F, < 250F

Well Deviation

Borehole Resistivity: < .02 @ BHT, > .02 @ BHT, Oil Base Mud, Cased Hole

Hole Condition

Reservoir — Rt 0

Conveyance Method

Help — On / Off — Return

Select known environmental effects/limits (here bit size is 8.5", BHT=310, mud is OBM)

Sample screen - Review ranking of equipment, for selection
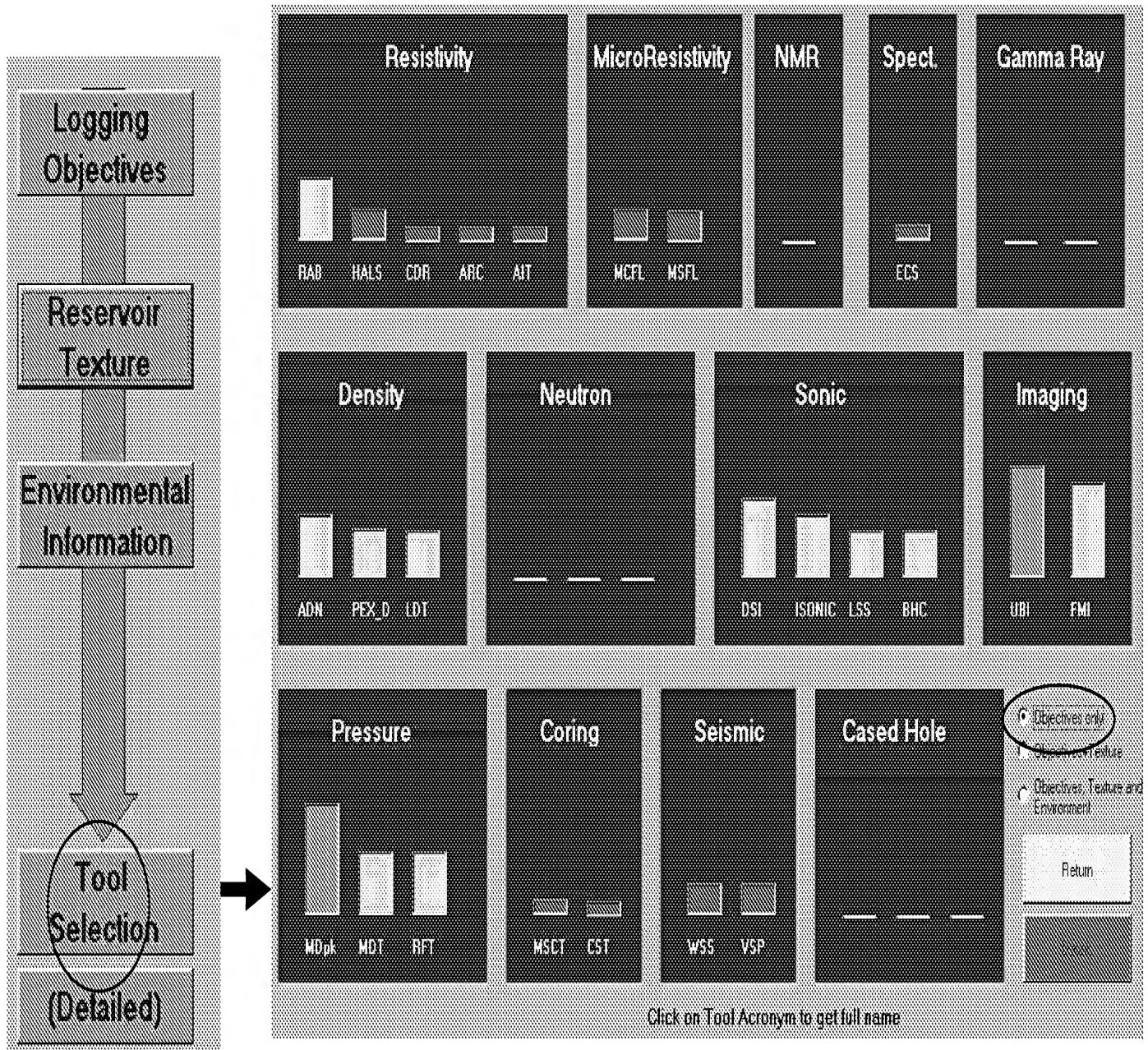
Here is a display ranking the tools *in each sensor category*.... that shows the impact of the various selections made previously. Here ONLY the impact of logging objectives (ie. Geomechanics) is shown, without the additional impact of Reservoir Texture or Environmental Information. See later screens to show impact of this additional information.

Refining the choice of tools by adding in more constraints.
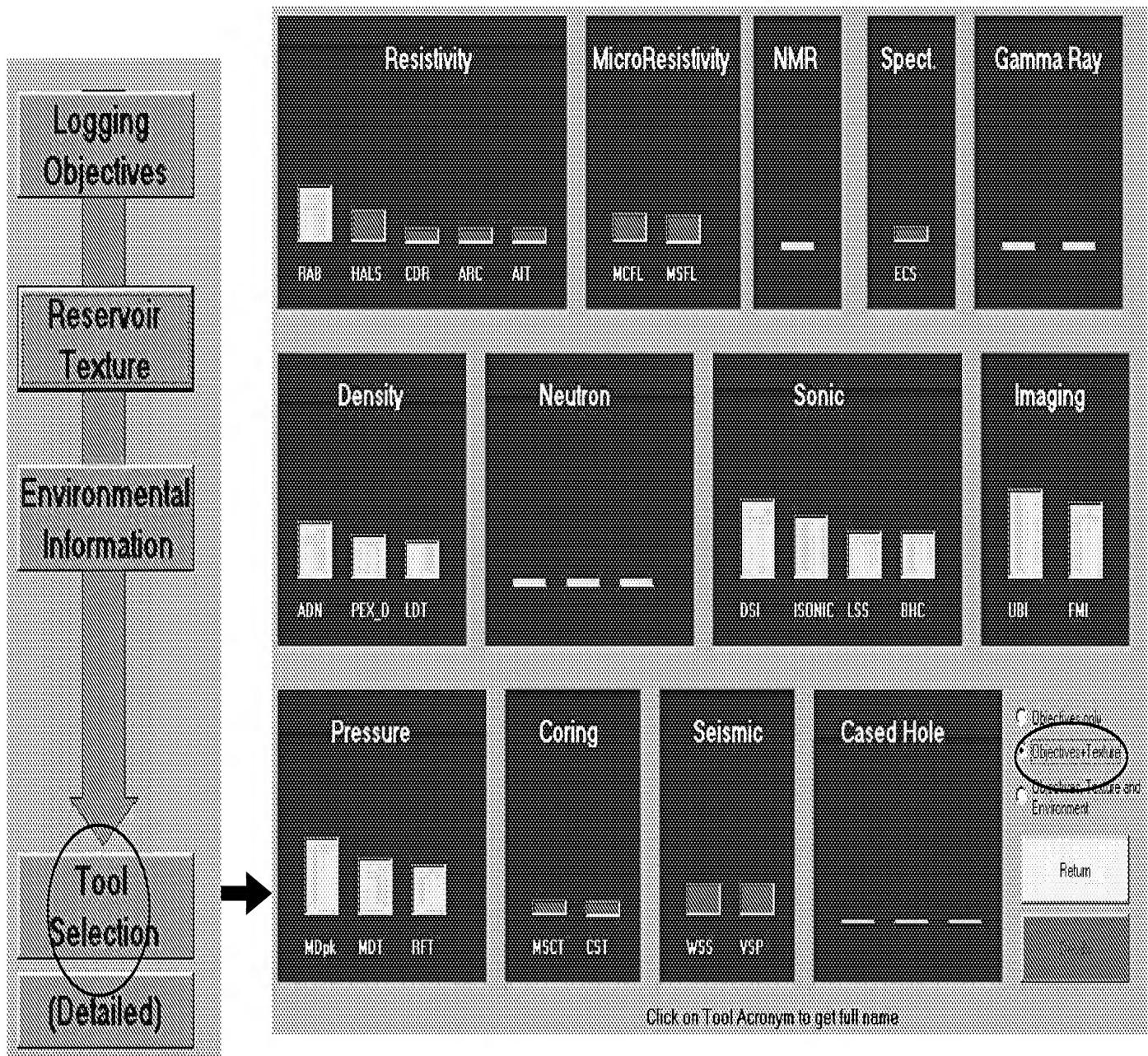
Now the additional impact on sensor selection from "Reservoir Texture" is included. (For example the stressed rock option chosen earlier degrades the ability of the MDT packer and imaging tools to make such good measurements, as borehole condition is likely to be degraded. Green code is good, Yellow is OK, Red means only use if nothing else available!)

Refining the choice of tools by adding *yet more* constraints.
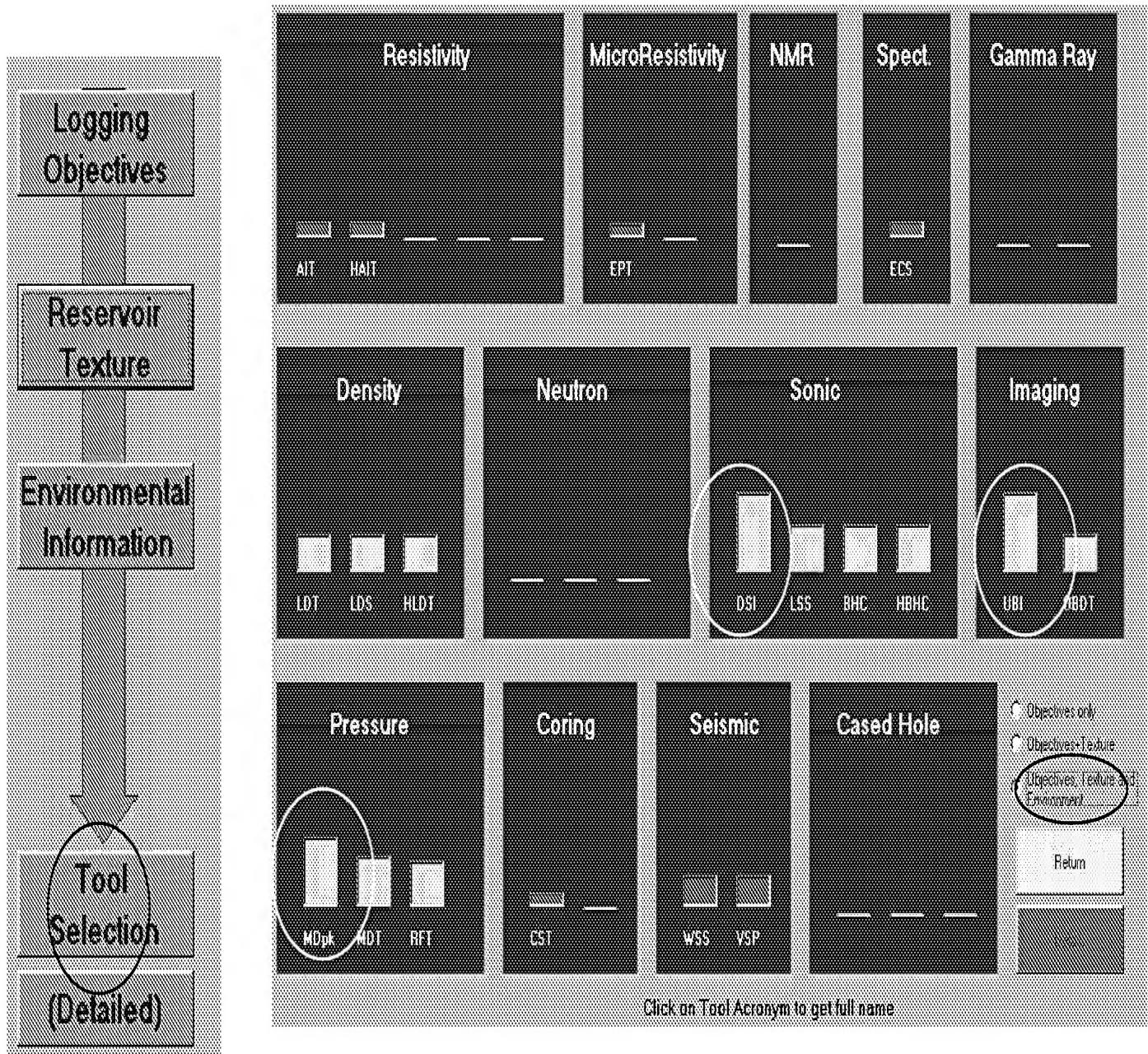
Now the additional impact on sensor selection from "Environmental Information" is included. (For example the RAB does not image in OBM, and also has a temperature limitation, so cannot be included in the list of available tools.) Based on this analysis, we should include UBI, DSI and MDT packer technology to address the Client need in this reservoir, along with LDT and perhaps VSP.

Other Issues:

- A working demonstration "Advisor" program exists

- Need to get corporate agreement on *ranking of sensors.*

- Need brief on line help (*eg. what is DSI, and why is

    it chosen to help with Geomechanics?*)

- Who will keep software updated

- We should be able to suggest an Answer Product that

    addresses initial need.